THE CHEMIST AND DRUGGIST

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Our Country and Colonial Subscribers are requested to furnish the Editor with any trade gossip that they may consider interesting.

Subscribers are requested to observe that, for the future, the receipt of The Chemist and Druggist in a *Green Wrapper* indicates that with that number the term of subscription has expired, and that no further numbers will be sent until the same has been renewed. We issue this notice very respectfully, not that we distrust our Subscribers, but simply because we find it impossible to keep an immense subscription list like that we now have, extending to almost every town in the world, in order without an exact system like this.

Editorial Notes.

THE results of Mr. Matthews's examination of the preparations known as "Hair Restorers" convince us that the publication of a series of Analytical Reports in these columns will bring to light many strange facts that ought not to be hidden from chemists and pharmaceutists. When poisonous cosmetics are declared to be perfectly harmless, we do the State some service by revealing their real composition. As a mixture of sulphur, glycerine, and acetate of lead will effectually blacken grey hair, it will be used as long as there is no better agent for producing the same result; but those who use it habitually should know that the principal constituent is an accumulative poison, and that its absorption by the system may be attended with baleful consequences.

The writer of the leading article in the current number of the *Pharmaceutical Journal* seems to have forgotten that the advancement of Chemistry and Pharmacy is the primary object of the Society with which he is connected, and to have arrived at the conclusion that the Examinations are intended to test the glibness of smatterers. He virtually admits that the certificate of qualification is the crown of pharmaceutical study, and while he deprecates "cramming," he explains a ready method of acquiring knowledge not unlike that peculiar process. The experimental science, Chemistry, is referred to as a subject which may be studied by reading a book, one page at a time; and as the student is apt to read too much, and understand too little, he is led to believe that the value of the text-book increases as its volume decreases. Fownes's *Chemistry* and Royle's *Materia Medica* are noticed as being too voluminous to be of any service to the "anxious youths" who are seeking "the easiest method of bringing themselves within the requirements of the law." The smaller works of Roscoe, Garrod, and Scoresby-Jackson, are regarded with favour by the writer; but he thinks that "even something slighter than these, and treating the subjects in a different way, is required by many of the existing class of students." Leschek's *Guide for the Modified Examination*, and similar works, *not yet published*, adapted for the other examinations, are cited as examples of the desiderata. Mr. Leschek has undoubtedly produced a very useful little work, but it is obviously intended to facilitate the operation of cramming, and the "puff direct" which it receives in the *Pharmaceutical Journal* will disgust scientific writers. When an important examining body, through its organ, recommends for study a book giving a bare outline of the subjects of examination, the authors and publishers of more important works may fairly complain; and those who hold that there is no royal road to knowledge must be excused if they condemn the perversion of function in strong language.

We understand that nearly 18,000 copies of the 20,000 printed of the *British Pharmacopœia* have been disposed of, and that it is in contemplation to print another edition of 10,000 copies.

In the year ending December 31, 1868, there were filed in the United States Patent Office 3,705 caveats, and 20,445 applications for patents; 12,959 patents were issued, 419 re-issued, and 140 extended. Compared with other years the business of the office was greater than that of the preceding period. The number of patents issued was more than double the number of 1865, and more than three and one-half times that of 1858. Since the United States Patent Office was first established its business has had a rapid growth in amount and in importance. In 1836, eight or ten persons were enough to transact all its business. Now between 300 or 400 are required.

What is "Milk of Sulphur?" Dr. Attfield says it is precipitated sulphur, adulterated with plaster of Paris; Dr. Redwood contends that the calcium sulphate is not an adulterant, but an essential constituent of the commercial article. Our occasional correspondent, Mr. F. White, referring to the question upon which these doctors differ, states that some years ago he tried in vain to induce his East-end customers to purchase pure precipitated sulphur. "It was useless talking about purity," he says, "so I calcined two ounces of the ordinary milk of sulphur, and used the residual sulphate to take a cast from a medallion. This cast I kept to show to customers, as a sample of what they took into their internals." In spite of our friend's ingenious device for instructing his customers, they would not buy the pure sulphur.

Professor Roscoe, F.R.S., addressing the Manchester Chemists' and Druggists' Association, on the 13th ult., expressed his approval of the new Pharmacy Act. He said that he believed it would be of immense value to the public, and would have a most important influence upon the profession. There was no doubt that the requirements of the Act were sound, and had been well thought over. There were a few points which may be amended, but on the whole the Act would be the means of raising the character of the profession of pharmaceutical chemists, and at the same time benefit the whole population.

The Editor regrets that through a mistake of the binder the extra advertisements issued with the January number

were misplaced. One of these advertisements related to an American nostrum, and consisted of four pages, printed in the style adopted in the literary portion of the journal. These four pages followed the "Notes of Novelties," and some subscribers may for a brief period have supposed that the Editor was responsible for their contents. No one could have been more surprised at the appearance and editorial style of this misplaced advertisement than the Editor himself.

Our Analytical Reports.

ON HAIR RESTORERS.

BY HENRY MATTHEWS, F.C.S.

THE use of various preparations for darkening or otherwise altering the colour of the human hair is extremely ancient, and it appears, from the number of dyes, washes, etc., now sold, that the practice of modifying or improving the natural colour of the hair is at the present time considerably on the increase.

The hair from its porosity, and from the fact of its containing a considerable proportion of sulphur, is capable of being easily altered in colour by the use of various metallic salts, the colour produced depending upon that of the corresponding metallic sulphide; for instance, salts of lead and silver would blacken or darken the hair, while those of arsenic, cadmium, and antimony, would tend to produce a yellow, golden, or red colour.

This property which the hair possesses of being affected in colour by the use of certain metallic salts, has given rise of late years to a new class of preparations for the hair, called "Hair Restorers." It is intended in this report to treat especially of these, leaving the preparations used to produce "golden locks" for future consideration. It will be seen that in many cases the labels of these "Hair Restorers" state that the preparations referred to contain no dye, while now and then a declaration appears on the label to the effect that the particular compound is not a dye. The truth of these statements very much depends upon what is understood by a dye. According to the common acceptation of the meaning of the word *Dye*, we must admit that most of these mixtures contain a dye, but if the word *Dye* is used in contradistinction to the term *Pigment*, we may then say that these "Restorers" do not contain a dye, and that the "restoration" is effected by the formation of a pigment in the very substance of the hair itself. A number of the best known or most advertised of these preparations have been submitted to a chemical examination, the results of which are subjoined:—

1. ROSSETTER'S HAIR RESTORER.

The label of this article asserts that "this preparation will restore grey hair to its original colour," that "it is not a dye," that it "acts directly upon the roots of the hair," and that consequently "its effects are gradual." In the directions for use we are told that it "must be used daily until the hair assume its natural colour," which will be "in periods varying from one to three weeks."

The sample examined consisted of a colourless fluid, and a greyish yellow deposit. The deposit consisted almost entirely of sulphur, with a minute quantity of carbonate of lead. The solution contained acetate of lead and glycerine.

In a bottle containing 10 fluid ounces, 44·8 grains of sulphur, and lead corresponding to 21·87 grains of acetate of lead, were found.

2. MRS. S. A. ALLEN'S WORLD'S HAIR RESTORER.

The label and wrapper of this preparation state that "it never fails to restore grey hair to its natural colour and beauty," that "it is not a dye," and that it "will not soil the skin, or most delicate head-dress." We are further assured that this "Restorer," is the best, because it contains no nitrate silver (*sic*) nor any other injurious ingredient."

The bottle examined contained 8¼ fluid ounces of mixture, composed, like the last, of a colourless fluid, and a yellowish grey powder, this latter consisting of sulphur, with a trace of carbonate of lead, the solution containing acetate of lead and glycerine.

The results of an analysis of the contents of the 8¼ ounce bottle indicated 75·6 grains of sulphur, and an amount of lead corresponding to 87 grains of acetate of lead.

3. F. E. SIMEON'S AMERICAN HAIR RESTORER.

This on its label and wrapper is "warranted infallible to restore original colour to grey hair," also "not to contain any nitrate of silver or any of the injurious substances which enter into the composition of ordinary hair dyes."

Like the preparations previously noticed, this consisted of a colourless fluid, and a yellowish grey deposit, and also contained the same ingredients, viz., sulphur, acetate of lead, and glycerine, the deposit in this case being pure sulphur.

A bottle containing 8 fluid ounces furnished 31·8 grains of sulphur, and lead corresponding to 45·1 grains of acetate of lead.

4. HALL'S VEGETABLE SICILIAN HAIR RENEWER.

The label of this "Renewer" states that "the proprietors are entirely confident that it will bring back the hair to its original colour," and that "it cures all diseases or humours of the scalp.

This preparation was found to be similar to the others, the deposit containing sulphur, sulphate of calcium, and a trace of sulphate of lead; the solution containing acetate of lead, glycerine, and a trace of acetate of calcium. In distinguishing this preparation by the epithet "Vegetable," the maker has allowed his inventive faculty to overstep the bounds of truth, and has given moralists another instance of the common commercial practice of calling things by the wrong names.

A bottle containing 6 fluid ounces furnished 70·2 grains of sulphur, mixed with sulphate of calcium (milk of sulphur having evidently been used in this case), also lead corresponding to 50·8 grains of acetate of lead.

5. HELMSLEY'S CELEBRATED AMERICAN HAIR RESTORER.

By the label we are assured that "this is not a dye, but is prepared for the purpose of restoring grey hair to its original colour."

The preparation consists of a deposit and a colourless fluid. A bottle containing 6·5 fluid ounces gave 37·8 grains of a deposit, consisting of sulphate of lead, sulphate of lime and a small proportion of sulphur, while the residual solution gave lead corresponding to only 0·3 grains of acetate of lead. The solution also contained acetate of calcium and glycerine. The sulphur used in this case was evidently impure milk of sulphur, containing much sulphate of calcium, double decomposition having taken place between this last and the acetate of lead used in preparing the compound.

6. AGUA AMARELLA.

This preparation is referred to on its wrapper as "this miraculous fluid," and on its label as "this truly wonderful discovery." The label states, moreover, that it "restores grey hair to its original hue," and that it "is free from all the dangerous and disagreeable properties of hair dye."

This, like the others, consists of sulphur (containing sulphate of calcium) acetate of lead and glycerine.

A 6 ounce bottle furnished 25·7 grains of deposit consisting of sulphur and sulphate of calcium, also an amount of lead corresponding to 1·5 grains of acetate of lead.

7. MELMOTH'S OXFORD HAIR RESTORER,

Or, according to the label, "Capillary Liquid for Restoring Grey Hair to its Original Colour." This also "is not a dye."

Here again we find sulphur, acetate of lead, and glycerine.

A bottle containing 4½ fluid ounces gave a deposit of 17·2 grains of sulphur, and lead corresponding to 30·8 grains of acetate of lead.

8. ALEXANDER ROSS'S GREAT HAIR RESTORER.

The label of this states that "it contains no dye, and will restore grey hair to its pristine hue."

This preparation was found on examination to differ considerably from the others, inasmuch as it contained no sulphur and no glycerine, but consisted entirely of solution of oxide of lead in a solution of potash, with a trifling deposit of carbonate of lead.

An 8 ounce bottle gave 3·8 grains of oxide of lead.

9. PELLETT'S HAIR RESTORER.

This, according to its label, "is not a dye," "is perfectly harmless, contains all the latest discoveries," and "will restore grey or white hair to its original colour."

This is a somewhat similar preparation to most of those previously considered, containing sulphur with sulphate of calcium and sulphate of lead, acetate of lead and acetate of calcium, but no glycerine.

A bottle containing 5¼ fluid ounces furnished a deposit consisting of sulphur mixed with sulphates of lead and calcium, weighing 49·7 grains, and lead in the solution corresponding to 127·8 grains of acetate of lead. In this case, as in No. 5, adulterated milk of sulphur had been used, and double decomposition had occurred between the lead and calcium sorts.

10. (NO LABEL).

This sample was forwarded for analysis by a client, and consisted of sulphur, acetate of lead, and glycerine. A bottle containing 9¾ fluid ounces furnished 58·7 grains of sulphur, and lead corresponding to 83·5 grains of acetate of lead.

It should be mentioned that the above preparations, with the exception of numbers 5 and 8, contained, besides the ingredients mentioned, rose water, lavender water, or other perfume.

On looking at the composition of these preparations one is necessarily struck by their great similarity of composition, and is inclined to think that the makers of hair restorers are like the actors in "The Critic," seeing that "when they do agree their unanimity is wonderful," for with trifling exceptions, the constituents of all these restorers are the same, the proportions only varying.

With regard to whether they are dyes or not, this, as I have said before, depends upon what is considered to be the meaning of the word *Dye*; but most persons would take a common-sense view of the subject, and regard them, as the writer does, if not as dyes, as something very closely allied to dyes.

All these preparations are said to restore grey hair to its original colour, but as their effect is due to the formation of the black sulphide of lead in the hair, it is difficult to understand how these restorers will carry out the professions on their labels, in cases where the original colour has been red or auburn, or any other light shade of colour.

The constant use of these preparations containing lead cannot but lead to serious if not fatal results, being calculated to produce various diseases analogous to lead-painter's or plumber's colic, lead-poisoning, and even palsy. In one or two of the preparations examined much merit is claimed on account of their containing no nitrate of silver, and so not being liable to stain the skin. It is quite true that they contain no nitrate of silver, but then preparations of lead, although they do not stain the skin, are much more injurious to health than silver compounds.

The amount of sulphur contained in most of these preparations appears to be useless, that contained in the hair being generally sufficient to convert the lead into sulphide. The sulphur is probably intended to supply a deficiency of sulphur in the hair should such exist, and, perhaps, also as a curative agent for any affection of the skin which may exist. No exception can be taken to the use of glycerine in hair washes.

Two advertisements, which recently appeared in the daily papers, undertook to forward a recipe for a hair wash on receipt of a certain number of stamps. These recipes are as follows, the first being accompanied by a testimonial from the late Dr. Herapath:—

I. ROSE HAIR WASH FOR RESTORING GREY HAIR TO ITS ORIGINAL COLOUR.—This wash, by being applied every morning by ladies with a small sponge in each of the partings in the hair, and by gentlemen well rubbing it into the scalp, will, in about fourteen to twenty days, restore grey hair to its original colour; and by constant use will produce a brilliant and lasting gloss, and prevent the hair from falling off without the aid of grease, oil, or any cosmetic. (See Dr. Herepath's Opinion.)

"Old Market, Bristol, 30th June, 1868.

"My Dear Mr. ——,—I have carefully analysed your preparation for restoring grey hair to its original colour, and pronounce it a most invaluable preparation, from the fact of its being free from all preparations of lead or silver, which are so injurious to the system by constant use; your hair wash will become a most valuable addenda to a lady's toilette, its use being so simple, its effect so great and lasting. Wishing you every success, I am, my Dear ——, yours sincerely, W. HERAPATH, M.D."

The Recipe.—Take of milk of sulphur, 1 drachm; mix it as you would mustard; then add 12 oz. of distilled rose water, and 3 drachms of pure glycerine. Strain through fine muslin; shake well before using. Mix the ingredients yourself, as I have seen several bottles of the wash with the sulphur floating on the top, from the ingredients not having been properly mixed and strained.

II. THE FORMULA (from a correct analysis) for making, at the cost of one shilling (which usually costs six times the amount) a bottle of the most popular and effectual Hair Restorer of the day:—Acetate of lead, 45 grains; precipitated sulphur, 60 grains; glycerine, half a fluid oz.; rose water, one fluid oz.; distilled water, to fill up to 10 oz.

Directions for Making.—Well rub the acetate of lead with the precipitated sulphur in a mortar, gradually add the glycerine, and lastly the rose and distilled waters, and keep in a well corked bottle.

Directions for Use.—Well shake the bottle; then with a small brush apply it to the hair from roots to ends. The restorer must be used every day until the hair becomes its natural colour, which will be in about seven to fourteen days; afterwards once or twice a week will be sufficient. A bottle may be obtained at the price mentioned above.

The second recipe, it will be seen, is adapted to produce a mixture of precisely the same character as the "Restorers" I have analysed. The product of the first recipe, however, contains no lead.

In conducting the investigation recorded above, I have been assisted by Mr. H. BASSETT, F.C.S.

Veterinary Notes.

BY W. HUNTING, M.R.C.V.S.

ON GRIPES OR COLIC.

PERHAPS the most common acute disease horses are subject to is Colic or "Gripes." The term is used very vaguely, being applied to nearly every case of abdominal pain, from indigestion up to inflammation of the bowels. We propose in these remarks to limit its use to cases of indigestion, accompanied by abdominal pain—cases in which the pulse does not become hard, and never rises above forty-five beats per minute, in which the pain, although violent, has periods of remission.

Colic is always caused by bad feeding; the food may be wrong in quality or quantity, or good food may be given at very irregular intervals. A favourite idea is that cold water taken by a heated animal is *the* cause *par excellence*. Cold

water, we speak advisedly, never produced an attack of colic unless indigestion had previously deranged the digestive organs. Cold water may be the *exciting*, but indigestion must be the *predisposing* cause. Before saying what should be done let us shortly point out some common errors. Wretched animals in a paroxysm of pain are frequently kept trotting about This is not only cruel, but dangerous. Abominable irritants too are frequently given, as tobacco or turpentine. Now these are inexpedient, as more efficacious and safe remedies exist. We are aware that some experienced veterinarians regularly use the following:—

Ol. Terebinth., ℥j.
Ol. Lini, ℥iv.
Sp. Æth. Nit., ℥j.

It has one advantage, viz., that it pleases an ignorant horse-owner. A horse with violent abdominal pain will not stale; now turpentine soon acts upon the kidneys, and thus urged an animal will frequently empty its bladder, though the colic remain uncured; and as, strange to say, numbers of people believe that when a horse has colic "his water is wrong," the action of the turpentine is misinterpreted, and the medicine is thought wonderful. Another common error is to give sedatives, having a tendency to produce constipation, such as opium, which is one of the most common ingredients of colic draughts. When we say that constipation, to a greater or less extent, exists in nearly every case, it will be readily seen why opium should be avoided. Now, what should we do? Get the animal, if possible, into a loose box, and there prevent him from lying on his back or rolling over, by a judicious use of the whip. We advise this under the belief that not a few strangulations are caused by the rollings of an animal in pain. Next give some antispasmodic. The following draught is simple, and in our experience very successful:—

Sp. Æth. Nit.,
Sp. Pimento
Tr. Belladonnæ } ℥j. of each.

To be given in a pint of warm water, and repeated in half an hour, if necessary.

For the majority of cases this will be sufficient, but the tendency to constipation should never be lost sight of, and, if possible, a dose of physic should be given.

Injections of clean tepid water should also be used; they should not be forced into the bowel, but only gently introduced, for force distends the rectum, and when this force is removed, the gut, like all hollow muscular organs, contracts and expels its contents—an event to be avoided. The longer in reason an injection is retained the better; its immediate and forcible ejection is an occurrence of bad omen.

WORMS IN HORSES.

The intestines of the horse are infested by three or four different kinds of worms, of which tape worms are rarest, and ascarides, or round worms, commonest. These latter are usually located in the stomach and small intestines. When in large quantities they are voided at times with the fæces, and this, with the poor condition of the animal, are the two symptoms of their presence. The absence of worms in the dung is not proof positive that an animal is free from them. In this case we can only diagnose negatively, by the poor condition and absence of any other cause. The most effectual remedy is a good dose of aloes, given on an empty stomach. This effectually removes the parasites, but as the patient is probably weak a little tonic medicine is required, a very good form in such cases being—

Canth. Pulv., ℈j.
Arsenic, ℈j.
Ferri Sulph., ℥xij.

made into twelve powders, and one given in the corn every day, or we may give half the powders and then the physic, and then the other six.

As a matter of tact, it will be found best to give the powders as "*worm*" powders, and advise a dose of physic after, and this because horsemen have a sort of idea that worm medicine is not *au fait*, unless as powders. As there seems to be a somewhat wide-spread notion that arsenic is a good vermifuge for the horse, I may say that I have seen two cases—one most marked—in which horses who had never voided a worm, and were not suspected of having them, were slaughtered, as done work, after a course of arsenic, given as a tonic, in doses of ten grains daily, and found to be literally full of worms. As regards the tape worm, I am not aware of any case having been successfully diagnosed or treated. The tape worm of the horse is only small, and the joints might easily pass out in the dung unobserved. I have only found them on *post mortem* examination, but should a case be met with I would try Ol. Filicis Maris, in doses of two or three drachms.

WORMS IN DOGS.

Dogs are subject to two kinds of intestinal worm—the tape worm and the ordinary round worm. The round worms, or ascarides, are pretty easily removed by the use of powdered areca nut, in doses, for ordinary sized dogs, of about one drachm made into a pill.

The powder is rather light and bulky, so for small dogs had better be made into two pills, and given one after the other. The areca nut should be given over night, and followed by a dose of about an ounce of castor oil the first thing in the morning. To make sure of removing all the worms an animal should have at least two doses given at an interval of a week. In place of areca nut, worm seed or santonica may be used. The dose of the powdered seed for a medium sized aged dog is about six grains, given as a pill, in the same manner as areca nut.

"Stonehenge," in his work on the "Greyhound," recommends Indian Pink, as a vermifuge. An infusion of half an ounce, in a pint of boiling water, to be given, when cold, at night, and followed by castor oil on the morning; of its action, we have no personal experience.

The tape worm is by no means so easily removed. This parasite attaches itself to the intestine by hooks situated on its head, and as it grows detaches the posterior joints filled with eggs. The presence of these joints in the fæces of the animal corroborates a diagnosis, founded on the miserable condition of the dog. The chief difficulty is the head; for so long as it remains attached the parasite grows, and causes irritation; sometimes fits.

The ordinary anthelmintics seem to be powerless on the tape worm. We consider the best to be the oil of the male fern, given in linseed tea, or tied up in a small piece of sausage skin. The dose for a medium sized dog, say a bull terrier, is about half a drachm. It should be repeated in a week or so, and if the dog is weak a little tonic medicine is required. Another drug is spoken of by some very highly, but of its action I can say nothing. The dose is from four to eight drachms. I refer to the Abyssinian Kousso.

Pharmaceutical Society of Great Britain.

EVENING MEETING.

*Wednesday, February 3.**

Mr. HILL, Treasurer, in the Chair.

THE minutes of the preceding meeting having been read and signed correct, and subsequent donations to the library and museums acknowledged,

* Reported specially for this journal.

Professor ATTFIELD proceeded to read the following "laboratory notes."

ON CRYSTALLISED CARBONATE OF MAGNESIUM.

The author remarked on the production of terhydrous carbonate of magnesium ($Mg\ C\ O_3\ 3\ H_2\ O$) by the action of heat on a solution of *Magnesia Alba* ($3\ Mg\ CO_3\ Mg\ 2\ HO\ 4\ H_2\ O$) in carbonic acid, and stated that the action of extreme cold for any length of time on a similar solution caused the deposition of transparent tubular crystals having a different composition, being composed in fact of true carbonate of magnesium, with five molecules of water of crystallisation. The author noticed this pentahydrous carbonate of magnesium simply to draw attention to some unusually large crystals of the salt recently sent to him, in which he was enabled by goniometric measurement to make out every angle mentioned by Brooke (*Annals of Philosophy*, vol. vi. p. 375), and by quantitative chemical analysis the true composition of the salt.

ON ARSENICAL PLAYTHINGS.

The author drew attention to the existence of arsenic in the green pigments used on children's playthings, cotton reels, etc., remarking that a further word of caution might prove useful to indulgent parents, whi'e there was not the slightest occasion for alarm, if persons observed ordinary watchfulness.

ON THE SEPARATION OF TIN FROM ANTIMONY.

Alluding to the usual process adopted in the separation of tin and antimony, viz., that based on the precipitation of antimony by metallic iron, the author remarked on an occasional discrepancy of results, the percentage of antimony coming out too small, and that of tin too large, referring the error to the fact, which he proved by the citation of several experiments, that antimony was soluble in a solution of ferri-chloride, and that this compound was often produced during an analysis, owing to the admission of air and the too protracted duration of the experiment. The author recommended the use of large beakers or precipitating glasses, a considerable quantity of well boiled and still boiling water, and rapid washing by decantation.

ON A CRYSTALLINE DEPOSIT IN AN OPIUM LINIMENT.

The author had tested a greenish yellow semi-crystalline precipitate, produced on mixing one pint each of tincture of opium, soap liniment, and compound camphor liniment, for the purpose of ascertaining whether it contained any of the active principles of the opium. His analysis had shown that it consisted solely of the acid meconates of potassium and (mainly) sodium, with a little sulphate of calcium; its occurrence in a liniment being therefore apparently of no moment.

In answer to an inquiry by the Chairman, Professor ATTFIELD said that the precipitate appeared after a few hours, or even days.

Mr. BLAND asked whether the precipitate was entirely free from morphia?

Dr. ATTFIELD replied in the affirmative, remarking that when he received the sample it had already been washed, though nothing was obtained from the washings.

Mr. ROSE remarked on the importance of examining the nature of precipitates obtained in pharmaceutical preparations, and considered that such notes were well calculated to attract the interest of pharmacists.

The PRESIDENT considered that such investigations were invaluable as an aid in the construction of new pharmacopœias.

Dr. ATTFIELD said, that if any gentleman would bring such cases of uncertainty under his notice he would be happy to make the necessary investigations. He then read a laboratory note

ON SULPHATE OF POTASSIUM IN ERGOT.

The author had had his attention drawn to crystals produced after the addition of spirit of wine to the extract of ergot, as directed in the British Pharmacopœia process, for the preparation of *Extractum Ergotæ Liquidum*, with a request that he should ascertain their nature, and say whether this separation involved deterioration of the extract. Having stated that the crystals were sulphate of potassium, the author said that their presence or absence in ergot might be considered a matter of no therapeutic importance; the presence of this salt had, however, not been previously noticed by chemists who had analysed ergot.

A discussion ensued as to the best method of keeping ergot; general experience seemed to point out that too much should not be powdered at once, and that the containing vessel should not be tightly closed; the attacks of weevils might be guarded against by the use of carbolic acid or camphor; the latter was pointed out as a very useful agent in the preservation of museum specimens.

Professor ATTFIELD then read a laboratory note

ON WHITE PRECIPITATE.

The author referred to the examination of numerous samples of "White Precipitate," made by Messrs. Barnes and Borland, which showed the general absence of non-volatile adulterants in this preparation, although some of the samples did not contain the officinal proportion of 79½ per cent. of mercury, but only 65½ per cent., the proportion in the fusible white precipitate of old Pharmacopœias, The author's object was to show that while the property of complete volatility in "white precipitate" does not imply perfect purity, the character of fusibility does not necessarily indicate that the specimen only contains 65½ per cent. of mercury, and the quality of infusibility does not prove that it contains the officinal proportion of 79½ per cent. Six samples of "white precipitate" were examined; all were free from non-volatile impurity. Four sublimed without fusion, and yielded from 75·11 to 78·59 per cent. of mercury; one partially fused before sublimation, and yielded 73·08 per cent. of mercury, and the sixth fused entirely, and contained 72·00 per cent. of mercury. From these data and from the fact that it is impossible to wash away the last portion of chloride of ammonium without deteriorating the preparation, the author would recommend that in the next Pharmacopœia the quality of infusibility be included as well as the requirement that the preparation of mercury be not less than, say, 78 per cent.

Mr. UMNEY read a laboratory note

ON SULPHUROUS ACID.

The author having noted the introduction into the *Pharmacopœia* of this valuable therapeutic agent, its recent application by means of the spray-producer in affections of the throat by Dr. Dewar, and also its internal administration in typhoid fever by Mr. Hamilton and Dr. Jones, of Liverpool, gave the results of an examination of the sulphurous acid as found in pharmacy, showing that the specimens examined were very far from being of the strength of the British Pharmacopœia solution (9·2 per cent. of real acid), as they contained only from 2 to 6 per cent. of sulphurous acid. He attributed this variation almost entirely to the practical difficulties in making a solution of the high standard of the Pharmacopœia as a commercial article.

The experiments made and noted in his communication consisted in passing the gas eliminated from sulphuric acid by its reduction with charcoal into water under varied

circumstances, such as keeping iced water around the receiver, and effecting the solution of the gas under pressures of one, two, and four pounds to the square inch, the time given for the absorption of the gas varying from eight to thirty-six hours.

The conclusions he deduced from these experiments were chiefly that the strong solution of 9·2 per cent. could only be obtained with difficulty, and that the present official solution did not coincide in its described specific gravity, as compared with its percentage of acid, as a solution (prepared by British Pharmacopœia process) of 1·040 contained but 7·8 per cent. of sulphurous acid instead of 9·2 per cent. as indicated by the Pharmacopœia, or, in other words, if the specific gravity was correct, the strength was in error, or *vice versâ*. The acid of the British Pharmacopœia, 1864, was alluded to, the fact being noted that the same specific gravity was mentioned (1·040) although the volumetric measures of iodine required for its saturation were but equal to 8·3 per cent. of real acid. Results of experiments on a large scale were given, which showed that the strong acid as ordinarily obtained was from specific gravity 1·025 to 1·030. Working under pressure of six pounds to the square inch, produced in one case by a valve weighted to that amount, and in another by a column of water of twelve feet, and carrying on the process through cold nights, a solution of 1·038 was produced (7·2 per cent.); beyond this point it seemed impossible to go on a large scale.

He did not dispute the fact that in the experimenting laboratory a very much stronger solution could be made, giving the authority of Bunsen, who found that water absorbed at 32° Fah. 68·8 volumes, at 59° 43·5 vols., and at 75° 32 volumes. He suggested, however, the other well-known methods for the production of the gas to obtain the stronger solutions. The changes of sulphurous acid into sulphuric were noticed, and were shown, in the presence of air, to take place more rapidly in light green bottles than in ones of dark blue. He concluded thus:—

"I should suggest that a solution of 1·027 specific gravity, and containing 5 per cent. by weight of real acid, be substituted for the present official solution at the earliest opportunity (such a solution being sufficiently strong for medicinal purposes), there would then be no difficulty attendant upon the production of acid of such a strength; neither would there be the least justification for the entire absence of this solution from pharmacy. We should thus be giving the remedy a fair chance, and by its medicinal merits allow it to either retain its place in or be expunged from future Pharmacopœias. Such action alone will prevent the blame from being attached to the pharmacist, if such a valuable remedy should undeservedly be brought into disrepute."

Mr. D. Hanbury said that in testing sulphurous acid he had always been disappointed in the strength, which was always inferior to that ordered in the Pharmacopœia.

Dr. Attfield said that either the British Pharmacopœia process or the per centage was wrong; if so high a per centage was to be retained, then mercury or copper must be used in preparing the acid, if the process was to be retained then the required per centage must be less. It was only natural to suppose that the large proportion of inert insoluble gases produced in the British Pharmacopœia process would necessarily remove a large proportion of the soluble gases. There being still a few minutes to spare, Dr. Attfield drew attention to the wholesale adulteration of oil cake with the worthless product, as an article of diet, from mustard seeds. As chemical analysis apparently indicated an equality between cakes obtained from the different seeds, Dr. Attfield would advise chemists and others to make themselves acquainted with the physical characteristics of the different varieties of cake which were sufficiently distinct. A recent analysis of rape and mustard seed cake gave the author the following figures:—

	Cake from Mustard Seed.	Cake from Rape Seed.
Water	11·19	9·90
Ash	7·94	9·87
Fibre	12·16	13·76
Oil	14·14	9·09
Albuminous ..	31·69	33·30
Mucilage, etc. ..	22·88	24·08
	100·00	100 00

The Chairman then announced the next meeting for the 3rd March.

Abstracts of Foreign Papers.

A NEW STYPTIC COLLODION.

EFFORTS have been made to perfect collodion as an hæmostatic by the addition of substances which cause an instant coagulation of the blood, such as the perchloride of iron, but such mixtures have not been easy to make, and hence have not proved satisfactory. Carlo Parvesi communicates the following formula for a new collodion to the *Giornale di Farmacia di Torino*:—

Collodion	100 parts.
Carbolic acid	10 ,,
Pure tannin	5 ,,
Benzoic acid	5 ,,

Agitate until the mixture is complete.

This preparation, which has a brown colour, leaves on evaporation a pellicle exactly similar to that of ordinary collodion. It adheres strongly to the tissues, and effects the instantaneous coagulation of blood and albumen. Tannin effects a consistent coagulation of the blood, whilst benzoic acid has a cicatrising action on the tissues.

SCHŒNBEIN'S REACTION FOR HYDROCYANIC ACID.*

M. Leboigne makes some remarks on this reaction in the current number of the *Union Pharmaceutique*. He recommends that the guaiacum test-paper be kept in a stoppered bottle and sheltered from the action of light. Remarking on M. Schœnbein's statement that exposure to the vapours of the various acids did not affect the paper, the author states that his experiments justify him in citing the following amongst a considerable number of bodies which in the gaseous state or in solution gave the reaction supposed to be characteristic of hydrocyanic acid: the vapours of nitric, hyponitric, and hypochlorous acids; the vapours of iodine and bromine; chlorine, ozone, and ammonia; diluted solutions of sulphuric, nitric, and chromic acids, of permanganate of potassium, and, after the lapse of some time, of the chromate, nitrate, and chlorate of potassium. The reaction with these substances did not require the presence of sulphate of copper. As the reaction would thus discover the presence of a considerable number of substances besides hydrocyanic acid, the author would ascertain the absence of such substances previous to accepting its indications as a proof of the presence of hydrocyanic acid.

VOLUMETRIC ESTIMATION OF IODINE.

M. Bobierre recommends the following process for estimating iodine:—Make a concentrated solution of iodide of potassium: this should be used of an invariable strength. Make a standard solution of arsenite of potassium by combining 4·95 grammes of arsenious acid with 14·5 of crystallised carbonate of sodium, and making the solution up

* See our journal for December, 1868, p. 788.

to one litre. This solution corresponds with a solution containing 12·688 grammes of iodine per litre. Finally prepare a concentrated solution of bicarbonate of sodium.

Introduce 10 c.c. of the arsenious solution with 5 c.c. of the bicarbonate into a flask with a ground stopper; subsequently about 4 c.c. of pure colourless benzine.

Weigh a small quantity of perfectly pure iodine in two watch-glasses, dissolve it in some of the concentrated solution of iodide of potassium previously prepared, which must be the same for any comparative series of experiments; make up to 100 c.c. and transfer to a burette. On adding this solution drop by drop to the arsenic, excess is indicated by the rose coloration of the benzine. The relation between the arsenious solution and a known weight of iodine being thus obtained, the amount of iodine in any given sample may then be estimated.

ON THE ASSAY OF OPIUM.

M. SAINT-PLANCOT, in a communication to the *Revue Medicale de Toulouse*, draws attention to the very troublesome assays of opium, and of the varying results which are obtained by different chemists of undoubted skill. The author acknowledges the accuracy of the process indicated by M. Guilbourt, but condemns it because it is long and has other objections fatal to its employment in ordinary assays. The process published by M. Guillermond is also condemned by the author on account of the following objections:—In the first place the quantity of alcohol is too small to effect complete exhaustion of the opium; secondly, twelve hours do not suffice for the complete crystallisation of the morphine; lastly, the narcotine is not entirely separated from the morphine by washing with water. The author adds, further, that by following literally the instructions given by Guillermond he has sometimes failed to obtain much or any morphine from samples of opium of good appearance, and which gave good results by the process he was about to describe. The author also condemns on similar grounds the modification of Guillermond's process introduced by his son.

The author's process differs but little from that of MM. Guillermond; its superiority depends on the addition of a slight excess of ammonia to the alcoholic solution of opium and subsequent ebullition, and on the separation of the narcotine by means of ether. The following are the details:—Take 15 grammes of opium, triturate with 110 grammes of spirit containing 70 per cent. of real alcohol. When solution is effected, ascertain that the total weight is 125 grammes; agitate, filter, and collect a known portion of the tincture in a porcelain capsule; add a slight excess of ammonia, heat to boiling, and then set aside for twenty-four hours. Decant the liquor and wash the precipitate with water by decantation; triturate the precipitate with ether, collect on a weighed filter, wash with more ether and weigh. The relation of the morphine to the opium may be obtained by calculation.

Photography.

THE MANUFACTURE OF COLLODION.

THE subjoined formula is given by Mr. G. WHARTON SIMPSON, in his excellent *Year Book of Photography*:—To make the pyroxyline.—Take of—

Nitric acid ...	...	sp. gr. 1420	...3 measured ounces
Sulphuric acid	...	sp. gr. 1840	...3 ,, ,,
Best carded cotton wool ...		...	...2 drachms,

The cotton wool should be pulled into light, flat tufts, and spread ready for immersion. The acids should be mixed in a jar, which should stand in a deep dish containing very hot water. When the temperature of the acids is 150° Fah., which must be ascertained by means of a thermometer kept for the purpose, the cotton must be immersed, a tuft at a time, as rapidly as possible, each piece being pressed into the liquid by means of a stout glass rod or spatula. At the expiration of ten minutes lift the mass of cotton up with two glass rods, pressing away as much of the acid as possible, and plunge it into a bucket of water, which should be provided beforehand. Quickly stir and separate the cotton through the water, and, after washing a few minutes, change the water, and so repeatedly for a few hours; then wring out the water, and separate the mass into light tufts for drying. It may be spread out in a warm place, or dried over a water bath. The cotton will have gained from 30 to 50 per cent. in weight, and will dissolve at the rate of 5 or 6 grains to the ounce in a mixture of equal parts of ether and alcohol, with very little residue. In some cases unsized paper is used instead of cotton.

The following formula gives excellent results:—

Ether ...	...	sp. gr. 725	... 1 ounce
Alcohol	...	sp. gr. 805	... 1 ,,
Ditto ...	...	sp. gr. 820	... 1 ,,
Pyroxyline ...	...	...	15 to 18 grains
Iodide of potassium, sodium, or ammonium			6 or 7 ,,
,, cadmium	...	...	... 6 or 8 ,,
Bromide of ditto	...	...	... 1 to 3 ,,

This should be mixed a few weeks before use. With the larger proportion of bromide it will keep upwards of twelve months. For dry plates the proportion of bromide may be doubled.

The formula given will yield a collodion suitable for portraiture or landscape under what may be termed normal circumstances, but it will often happen that collodion should be prepared with a special view to the use for which it is intended. For dry plates it is important that it be adherent and permeable; for copying, that it readily give great intensity; for microscopic photographs and for negatives to be enlarged, that it give a textureless film; for wet collodion that it combine, in some degree, all these qualities. To aid in securing these results we may add one or two further suggestions. Collodion iodised with cadmium is sensitive, and keeps well; but it has a tendency to make the collodion, when new, gelatinous, and the film lumpy and uneven. It also, with some samples of pyroxyline, causes the film to repel the bath solution. The alkaline iodides—such as those of ammonium, etc.—on the other hand, no not make the collodion keep so well, but they tend to produce fluid collodion and an adherent and textureless film, which, moreover, by containing deliquescent salts, will keep moist a long time after leaving the bath. Where a powdery collodion is required for dry processes, the addition of about a grain to the ounce of carbonate of soda, and shaking it up for a short time, will effect the necessary change on horny collodion. After standing twelve hours the collodion may be decanted from the residue of the soda salt. This plan has been fonnd chiefly effective with collodion for the collodio-albumen process.

TESTING THE STRENGTH OF ACETIC ACID.

In attempting to determine the strength of acetic acid by means of the hydrometer, it will be remarked that certain anomalies present themselves; thus, there is no difference in the specific gravities of acids containing respectively 53 and 100 per cent. of true acetic hydrate, both having precisely the same density, 1063, at 60° Fah. (water = 1000). The heaviest liquid acid is that containing 80 per cent. the specific gravity of which is a trifle over 1073; but from

this point upwards to the acid of 90 per cent. there is no appreciable difference in the gravity. Again, a sample weighing 1067 may either represent an acid of 60 per cent. or may contain as much as 98 per cent. of true acid. It is, therefore, customary to guarantee the highest degree of concentration by specifying the temperature at which the acid becomes solid, or, rather, the highest point at which the already glacial acid resists liquefaction. Another guide which may often prove serviceable in the identification of an acid which, although of a high degree of concentration, is not actually glacial, is the fact observed, we believe, independently by M. Berthelot and Mr. E. Chambers Nicholson, that such acid becomes inflammable when the temperature is raised to the boiling point. If we take, for instance, about a drachm of the acid of 95 per cent. and heat it in a test-tube to the boiling point, it will be found that the vapour takes fire on applying a lighted match, and burns steadily as long as the ebullition is maintained; if, however, 10 per cent. of water be mixed with the sample, there will be great difficulty in causing inflammation, and the vapour, when ignited, will only burn with a lambent flame of pale blue separated cones, whilst below this strength the acid vapour is altogether uninflammable. By this test then (avoiding a too prolonged ebullition, which increases the strength of a weak acid), we have a ready means of estimating the quality of liquid samples of a high degree of concentration without resorting to the more tedious method of acidimetry.

It has only to be stated, in conclusion, that the boiling point of the ordinary qualities of acetic acid, although higher, is so little removed from that of water, that the indications of the thermometer are not much more to be relied upon than those of the hydrometer. In many respects carbolic acid imitates the deportment of acetic acid in the characters above described; it likewise becomes glacial upon separation of the last traces of water.—*The Photographic Journal.*

NEW METHOD OF INTENSIFYING NEGATIVES.

Mr. Wharton Simpson has introduced a new method of intensifying negatives, of extreme simplicity and efficiency, preserving delicacy whilst adding materially to the printing value of the image.

It consists in treating the fixed and washed negative with a solution of permanganate of potash, by which its colour is changed from the dusky grey, common to an iron developed negative, to a tint of a brownish yellow or olive by reflected light, and orange by transmitted light. Great increase in the adiactinic character of the deposit is produced, so that, with a comparatively thin and delicate negative, great vigour is obtained in the prints.

The permanganate of potash, on coming into contact with the silver image, is decomposed and parts with oxygen, which combines with the silver; at the same time binoxide of manganese is precipitated upon the image.

The best mode of proceeding is to place the fixed and washed negative in a dish containing a dilute solution of the permanganate, say ten grains or less to an ounce of water. The change is complete when the tint becomes as apparent at the back of the glass as at the front. The permanency of such negatives is necessarily a question of time; but, reasoning from analogy, we have no reason to doubt it, as binoxide of manganese is one of the most stable bodies with which we are familiar.

A transparency treated in this way, and then burnt in a muffle, would probably give a fine enamel picture, as oxide of manganese gives a fine vitreous black.—*Year Book of Photography.*

SUBSTITUTE FOR GROUND GLASS.

Mr. Woodbury proposes to use gelatine rendered semi-opaque by the addition of a white pigment. White pigmented gelatine gives an effect scarcely distinguishable in kind from opal glass, but as it can be used in a much thinner and more transparent layer, the softened delicate effect can be obtained without dulness; in fact, the degree of opacity is quite under the control of the photographer himself. Either for transparencies or for focussing-screens it answers well.

For preparing sheets of opalized gelatine the formula stands as follows:—

French clear gelatine	... ...	5 ounces
Water	... ...	20 „
Glycerine	... ...	¾ „
Oxide of zinc	... ...	1 „

After soaking the gelatine in the water for a few hours it is dissolved by gentle heat, and then filtered through flannel. The zinc white is placed in a mortar with the glycerine and one ounce of the water, and made into a soft paste. It is then stirred into the warm gelatine, and allowed to stand for a couple of hours, keeping the solution warm to allow the coarser particles to settle to the bottom; the upper portion is then carefully decanted to get rid of the sediment, or, if it be allowed to cool and become a jelly, a slice can be cut off the bottom, removing all the coarse particles. Where the photographer desires to make the sheets for use, it will be wise to use up his solution at once, as it will not keep well, especially in hot weather.—*Year Book of Photography.*

SWAN'S PATENT CARBON PROCESS AND AMATEURS.

The Chairman of the Autotype Printing and Publishing Company (Limited) in a letter addressed to the Editor of the *Photographic News* thus declares the intentions of the Company with respect to the use of Swan's patent by professional and amateur photographers:—"I beg leave to inform you that while we consider it but fair and just that those who use the patent for profit should make some payment, we have no intention of endeavouring to place any restrictions upon the use of the process by amateurs, for in their case we consider that the purchase of the tissue includes the right of using it."

DRAWINGS OF PATENTED DEVICES COPIED BY PHOTO-LITHOGRAPHY.

The Commissioner of Patents in the United States reports that the copies of drawings of patented devices ordered and paid for by the public now number about 700 per month, and that the expense of making them is about 1400 dollars per month.

He says:—"Several plans have been proposed for making these copies. Were there as many as fifty of each drawing wanted, the new art of photo-lithography would afford by far the best and cheapest means. It makes a *fac simile* of line-drawings, of any size desired, and when once the stone is prepared copies may be taken with little expense. Specimens have been furnished the office which show the wonderful perfection to which this important art has attained. The only difficulty in the way lies in the great number of drawings to be copied. Without reference to those on hand, the current issues will amount to nearly fifty a day. At the low rate of ten cents a piece, without any charge for specifications, fifteen or twenty thousand per year would cost more than many libraries could well expend for them; and the fifty or sixty large volumes annually which they would make would soon require more room than many libraries would have to spare.

"For a few copies, enough for the use of the Patent

Office, ordinary photography, or some of the late processes, would afford a cheaper means of supplying them.

"A photographic establishment in the Patent Office, adapted to copying drawings of large size, would supply the orders for them much more cheaply and accurately than by the method of tracing heretofore pursued."

Dentistry.

NITROUS OXIDE GAS AS AN ANÆSTHETIC.

At the annual meeting of the Dental Hospital, Soho-square, held on the 28th ult., the report announced that Dr. T. W. Evans, of Paris, had given the institution a donation of £100, for the purpose of introducing into the practice of the hospital the nitrous oxide gas as an anæsthetic. A short time ago a special committee had been appointed to investigate the value of this agent as such, and its applicability, as a general rule, to hospital practice. From the report of this committee it appeared that this gas had fully answered the expectations Dr. Evans entertained of its value, and was in every way suited for use in the majority of cases which presented themselves for extraction at the hospital, which was not the case with the anæsthetics previously in use. During the last few months this gas had been applied with great success on upwards of a thousand patients. It was therefore felt that the time had arrived when it was desirable to form a special fund for the purpose of enabling the hospital authorities to continue to afford to its poorer patients the benefit of this valuable anæsthetic, which, from its costly nature, the ordinary income would not allow them to do. Aid for this fund was earnestly solicited by the committee of management. In 1868, 16,504 patients had been relieved at this hospital, and 17,633 operations had taken place in the same period.

CARBOLIC ACID AS A POISON.

BY JOSEPH G. PINKHAM, A.M., M.D., OF LYNN, MASS,

*Professor of Chemistry and Toxicology in Berkshire Medical College.**

Carbolic acid may now be fairly said to have passed the period of its probation, and to have taken its place among the standard articles of the materia medica. Although long known to chemists, it is only within a very few years that its valuable properties as an antiseptic, disinfectant, parasiticide, and caustic have been recognised and understood by the medical profession. That it has rapidly come into general favour, the following brief enumerations of its principal uses will show: It is employed for embalming the bodies of the dead; for preserving anatomical specimens; for the treatment of primary syphilis, mucous tubercles, carbuncle, quinsy, diphtheria, and ulcerations of the cervix uteri; as a dressing for burns, fresh wounds, and fœtid, purulent sores; as a parasiticide and anti-pruritic remedy in certain cutaneous affections; as a disinfectant for hospital wards, privies, sewers, and clothing; as a preventive of contagion in cases of typhus, cholera, the cattle plague, and other infectious diseases; and even as an internal remedy in obstinate vomiting, chronic diarrhœa, spasmodic asthma, phthisis pulmonalis, chronic bronchitis, and malignant fevers. Much undoubtedly remains to be learned, both in regard to its therapeutic virtues and the dangers arising from its misuse; yet time and the results of future investigations can only modify, not wholly destroy the popularity it has so quickly attained.

* *Philadelphia Med. and Surg. Reporter*, Dec. 26.

Like all other potent medicines it is capable of acting as a poison. F. Crace Calvert, to whom is chiefly due the credit of having first brought this substance prominently into notice as a medicinal agent, says (as quoted by Dr. Caldwell in the *Boston Medical and Surgical Journal* for July 2nd, 1868):—"The great advantage which carbolic acid possesses over all other antiseptics, is, that it cannot be used for any illegal purposes, as arsenic or corrosive sublimate may." It is difficult to understand the ground for this assertion. Several fatal cases of accidental poisoning by carbolic acid are already on record, and one not fatal has come under my own cognisance. Indeed, this poison seems not inferior in power and rapidity of action to oxalic acid, and hardly so to strychnine, while a much smaller quantity than of the former is required to produce a fatal result.

In view of these facts, I have thought that a consideration of the subject from a toxicological stand-point might be of some value to the profession. It certainly becomes us, who use as medicinal agents drugs potent for evil, to study well their nature and powers, that we may guard, in every possible way, against the occurrence of accidents.

A full account of any substance, as a poison, would embrace a description of

1. Its physical and chemical properties.
2. The methods of separating it from organic mixtures as a preliminary to the application of chemical tests.
3. Its toxical effects upon the system, with the symptoms and post-mortem appearances involved.
4. Its antidotes.
5. The medico-legal evidence of poisoning by its use.

This scheme I propose to follow, even at the risk of repeating, under the first division of the subject, much that has been said before. The drug is so new to the profession that it may not be necessary to offer an apology for doing what, in the case of a substance better known, would be simply a work of supererogation.

I. PHYSICAL AND CHEMICAL PROPERTIES.

Pure carbolic acid ($H\,C_6\,H_5O$) is found in commerce in two forms, a glacial or crystalline and a liquid form. Glacial carbolic acid is a colourless solid, of low specific gravity, consisting of broken acicular crystals, which melt at a temperature of 95° F., and become liquid on the addition of s small quantity of water. Liquid carbolic acid has a specific gravity of 1·065, is easily volatilized, and boils at a temperature of 35° F. When pure, it is colourless, but as usually seen, its colour is a light pinkish-brown. Its odour resembles that of creasote, but is less penetrating and disagreeable. Its taste is hot and pungent. When brought in contact with the tissues of the body, it acts as a caustic, producing a white slough. Its vapour also powerfully attacks the mucous membrane of the eyes, nose, and lips.

Carbolic acid coagulates albumen, gluten, and caseine. It is called an acid, but it belongs more properly among the alcohols. It does not redden blue litmus paper, and the compounds it forms with bases, even those the most powerful, are unstable. With sulphuric acid it unites, forming a colligated acid. It forms with water a crystallizable hydrate, soluble in water and alcohol. Its compound with potassa, potassic carbolate, is a colourless crystallizable substance, easily decomposed by heat and the acids, which might possibly prove a valuable substitute for potassic hydrate as a caustic.

Carbolic acid dissolves in all proportions in alcohol, ether, glycerine, the fixed oils, and strong acetic acid. In regard to its behaviour with water, authorities differ. My own observations lead me to the following conclusions:—

1. With twenty times its weight of water (the minimum)

carbolic acid forms a solution, or, more properly speaking, a permanent emulsion.

2. With twelve times its weight of water, it forms, on agitation, a temporary emulsion, which, for all practical purposes, is equivalent to a solution.

The taste of the aqueous preparations and of dilute solutions in certain other menstrua, is warm, and not unpleasant while the odour is feeble. The impure acid, sold chiefly for disinfecting purposes, is of various degrees of strength and purity. Its colour is dark, and its odour much more marked than that of the pure acid. It may be well, at this point, to state that several preparations of different strength have been sold in the market under the name of "saturated solution of carbolic acid." To avoid mistakes, it would be well for physicians, when prescribing the drug for medicinal purposes, to write for the pure acid, dictating the menstruum if a solution be required. Carbolic acid is known by several different names, as phenol—more appropriate by far than the one it now generally bears—phenylic alcohol, phenylic acid, phenic acid, hydrate of phenyl, etc. It occurs in coal tar, associated with creasote, and the two have often been mistaken, the one for the other. Cresylic acid, a substance also found in coal tar, resembles carbolic acid in properties, and has been considered by some identical with it. Williamson regards it as a distinct compound, and gives its formula as $H C_7 H_7 O$.

Carbolic acid may be recognised by its odour, by its action on the animal tissues, by its behaviour with water, and by the following chemical test:

A splinter of deal, dipped first into the acid, and then into strong nitric or hydrochloric acid, will become blue on drying.

II. SEPARATION FROM ORGANIC MIXTURES.

The separation of carbolic acid from organic mixtures, as in the case of other destructible organic compounds, is always a difficult and sometimes an impossible task.

The proper method of proceeding would be as follows:—Cut up the solid portions of the mixture into fine pieces, add large proportion of warm distilled water, and agitate with a glass rod; let the whole stand for several hours, with occasional stirrings; filter through fine paper and distil, taking care that, as the process is nearing completion, the heat be not great enough to clear the non-volatile organic residue. It would be better to make use of a water bath, by which means the danger of clearing away may be completely avoided. Add calcic chloride to the distillate, and re-distil after the manner of concentrating alcohol. By these means the acid may be obtained sufficiently pure for recognition. The greatest care and skill are requisite, and even with them the experiment may fail, especially if all the poison had been absorbed into the circulation before death. If a portion has remained unabsorbed, its recognition is less difficult. All the customary precautions enjoined in such operations, should be observed.

III. TOXICAL EFFECTS UPON THE SYSTEM.

Carbolic acid operates as a poison both before and after its absorption into the circulation. Before absorption it acts as a caustic or simple irritant, according as the preparation employed is strong or weak. When pure, or in strong solution, it coagulates the albuminous portions of the tissues, thus preventing or retarding the process of absorption. The usual symptoms of corrosive poisoning attend this action. They are, however, less marked than with most corrodents, owing partly to the fact that carbolic acid acts as a local sedative, in this way diminishing the pain, and partly to the speedy occurrence of general symptoms, which, to a great extent, mark the local ones. Spasmodic stricture of the œsophagus is a common occurrence when the strong acid has been given per os. Owing to this fact vomiting is not likely to take place. Weak solutions produce no local effect except irritation; but as they are more rapidly and completely absorbed, the ultimate effect may be more dangerous.

After absorption the drug acts directly upon the nervous centres, causing headache, giddiness, trembling, convulsion, insensibility, stertorous breathing, contracted or dilated pupil, a rapid, intermittent pulse, excessive prostration and death. The surface of the body is usually pale, and bathed in cold perspiration. When the quantity taken is large, death may occur almost immediately from an overwhelming impression on the system, as in the case of oxalic and hydrocyanic acids. In auricles death seems due to a suspension of respiration from tonic spasm of the muscles concerned in the process, or from muscular exhaustion, caused by a long continued and rapid succession of clonic spasms. A prominent symptom is the profound insensibility which comes on in a very short time after the ingestion of the poison. Where death does not result from the general action of the poison, it may occur, after a time, from the severity of the local lesions. Carbolic acid is quickly absorbed, and quickly eliminated from the system. This fact is proved by the speedy occurrence of general symptoms after its administration, and the speedy recovery when the result it not fatal. The kidneys are the great agents of elimation, but there is good reason to believe that the skin, lungs, and intestinal mucous membrane may also take part in the process. A portion of the poison is undoubtedly destroyed in the system, and another portion eliminated unchanged.

Post-mortem Appearances.—The local lesions discovered after death are such as we would naturally expect to find from the caustic and irritant action of the poison. The strong acid causes the mucous membrane of the mouth, œsophagus, and stomach to become hard, white, and corrugated. The corrugation results from the contraction of the muscles in the walls of these organs. The several evidences of inflammatory action in its various stages may be observed. Congestion of the cerebral and spinal meninges has been noticed in animals, but it is not a constant phenomenon. The lungs are often engorged, and the heart is sometimes empty and flabby, sometimes distended with blood. The kidneys may be much congested, and the bladder distended with urine. In confirmation and further elucidation of the statements here made, I subjoin below an abstract of several reported cases of poisoning with carbolic acid, and an account of some experiments on animals, performed for the purpose of gaining information on this subject.

REPORTS OF CASES.

Case 1.—The following account is given from memory, as the gentleman who has the notes of the case is now absent in Europe:—

Miss A. L., a young lady, twenty years of age, was troubled exceedingly with ascarides, which, not content with their normal habitat, the rectum, kept migrating into the vagina, where they occasioned a distressing pruritus. Having tried, without avail, all the ordinary remedies, she took, on recommendation as a *dernier ressort*, an enema of carbolic acid dissolved in glycerine. The amount taken was large. I think about 145 grains. Alarming symptoms came on almost immediately, and medical aid, being near at hand, reached her in a few minutes. When first seen by the physician in attendance, she was in the act of falling from her seat to the floor. She rapidly became convulsed, delirious,

and finally nearly or quite insensible. The surface was cold and moist, the pulse weak and flickering, pupils contracted, and breathing stertorous. The case must inevitably have terminated fatally without the prompt and efficient treatment which it received. Free injections of milk were given, and the sphincter ani ruptured to facilitate the discharge of the liquid. In this way, the rectum was thoroughly washed out in a short space of time. The constitutional symptoms were, at the same time, combatted by ammonia, camphor, and other diffusible stimulants. In about fifteen or twenty minutes, a copious flow of limpid, colourless urine came on, which lasted several hours. The exact amount of urine passed was not ascertained, but it must have been enormous. Its odour was slight but peculiar, not that of carbolic acid, nor that of normal urine. No chemical examination was made. Under the treatment, the patient soon began to amend, and when I first saw her, some two hours or more after the injection had been taken, she was reclining upon a sofa, with a flushed countenance, seeming very weak, and in some pain, but perfectly conscious. A severe rectitis followed, which was readily controlled by appropriate treatment, and in a few days the patient was entirely recovered. It is well to remark that the ascarides were effectually destroyed.

Case II.—Reported by Mr. Frederick Sutton, in the *Medical Times and Gazette* for April 25th, 1868. S. C. aged 43, took, instead of a black draught, one ounce of carbolic acid, which was kept in the wards for disinfecting purposes. Seen within five minutes after the poison was taken. She was reclining in a chair insensible; pupils contracted; face blanched and bathed in perspiration; pulse 100 p. m., feeble and very intermittent; respiration stertorous and smelling strongly of the fluid. There was slight lividity of the lips and tips of the fingers. She rapidly became worse, and died within an hour and a half after taking the poison, the body becoming much swollen before death. Spasmodic stricture of the œsophagus prevented the patient from swallowing, and caused great difficulty in introduciag the tube of the stomach pump.

Autopsy seventeen hours after death. At the angles of the mouth the skin was rather discoloured and shrivelled; the interior of the mouth was very white; tongue dry and chippy; the mucous membrane of the œsophagus was dry, and shrunken, and of a brownish colour. The stomach contained about a pint and a half of partly digested food. The mucous membrane could be readily peeled from the walls of the stomach; there were several dry, white patches, on the surface of the rugæ, and the whole interior of the stomach was slightly inflamed. The walls of the duodenum were similarly affected, though in a slighter degree. There were all the morbid appearances that could be fairly attributed to the action of poison.

Case III.—Reported by Professor Taylor, in the Guy's Hospital Reports for 1868. A child aged one year and nine months swallowed two tea-spoonfuls of the ordinary dark-coloured acid. Seen ten minutes after the poison was taken. When admitted into the Hospital the child lay in its father's arms, insensible to all external objects; but in a short time it recovered itself. The pupils were contracted and insensible to light. Pulse 120 p. m., and very weak,—could be counted with great difficulty. There was a strong tarry odour to the breath. The respiration was much impeded. The surface was cold and clammy, the face pale and covered with cold perspiration. An emetic was given, but owing to spasmodic structure of the walls of the œsophagus the patient was unable to swallow, and it was returned through the nose. Tracheotomy was performed, and the little patient obtained some relief, but sank away and died at the end of twelve hours. The post-mortem appearances were similar to those detailed in the foregoing case, except that the stomach did not present such marked evidences of inflammatory action. Death seemed to result from the local action of the acid upon the respiratory passages.

Case IV. Reported by E. S. Machin, Esq., in the *British Medical Journal* for March 7th, 1868.—Three persons in the workhouse were dressed with carbolic acid instead of sulphuric lotion, for the itch. The patients were women, aged respectively 23, 60, and 68 years. The acid had been applied to the entire surface. A few moments afterwards they complained of headache; after which they were taken with giddiness, and rapidly became insensible. The girl, aged 23, and the mother, aged 60, died in the course of forty hours. The third patient rallied in about four hours, and recovered after a few days. No autopsy in the fatal cases. The acid used was Calvert's carbolic acid for disinfecting purposes, and was in appearance dark and oily. About six ounces were used in dressing the three cases.

Remarks on the foregoing cases.—It will be observed that in all but the first of these cases, the crude, or impure carbolic acid was employed. On this account the effects may have been somewhat more complicated. Yet they agree in detail essentially. In each case the patients became unconscious very speedily after poisoning occurred. In each case there was great depression of the vital energies with its various concomitants. Muscular spasms are not noted in any case but the first. The absence in the others may have been due to the large quantity of the poison used, and the powerful sedative following it.

Experiment I.—Mouse. One minium of the pure liquid acid, dissolved in water, was injected under the skin, over the thorax. The animal ran about, giving signals of pain immediately. In thirty minutes he fell over on his side, making rapid movements backwards and forwards with his legs. These movements continued 90 seconds, and then ceased, the animal simply gasping. In 30 seconds more he was dead. Autopsy 20 minutes after death. Liquid all absorbed. Diffuse redness under the skin in the neighbourhood of the injection. No other morbid appearance.

Experiment II.—Rat. Weight of the animal, eight ounces. Injected one minim of the pure liquid acid, dissolved in water, under the skin over the shoulder. Remains quiet.

In 2 minutes, trembles violently.

5 m. Falls over on side in convulsions, a rapid succession of contractions and relaxations of the muscles of the legs and body, passing in waves from head to tail; once in about three seconds a general spasm, bending the body backward and throwing out the legs. Some of the general spasms double. Animal apparently unconscious.

15 m. Spasms somewhat less violent. Gives no sign of pain, and makes no motion whatever when the eyeball is touched with the point of a pin. No motion of lips or tail.

20 m. Same condition.

25 m. Gives some evidence of returning consciousness, moves tail, and seems trying to rise. Spasms as before.

30 m. Same condition.

35 m. Winks partially when anything is brought in contact with or even near the eye. Spasms continue.

43 m. Spasms less violent. Struggles to rise. Has been held in hand for last twenty minutes.

48 m. When placed on his side on the floor, rolls over on his belly, but cannot stand.

50 m. More decided evidences of returning consciousness. Crawls along a little.

52 m. Dies suddenly, with two general tremors. No gasping.

Autopsy, 2 hours and 30 minutes after death. Membranes

of cerebrum and cerebellum much congested. Blood extravasated beneath the arachnoid. Other portions of the encephalon normal. The upper portion of the spinal cord also shows congestion of the meninges, very marked in spots, and diminishing gradually downward. Lungs engorged. Right side of heart, both cavities, distended with venous blood. Pulmonary arteries ditto. Left side of heart partially filled with dark blood. Kidneys congested. Other viscera normal. At the point of injection there was a flat hard lump about eight lines in breadth, and two in thickness. The tissues around were highly inflamed.*

Experiment III.—Small cat. Eighty minims of the pure liquid acid were thrown into the stomach by means of a small glass syringe and an elastic catheter. The animal, when released, ran rapidly around the room, and then became quiet, crouching down in the corner.

2½ m. Trembles. Seems trying to vomit.

5 m. Falls over partially on one side. Muscles of whole body twitch spasmodically. Opens and shuts mouth. Appears totally unconscious.

7 m. Spasms more violent. Affect particularly the muscles of the legs and the sides of the body. One succeeds the other rapidly, but irregularly. Respiration stertorous. Pupils dilated and responding only feebly to light. Observe an occasional general spasm like those described in Experiment II.

20 m. General spasms fifteen per minute, feeble. Other symptoms as before, except that the pupils are totally insensible to light.

From this time, for upward of half an hour, the symptoms remained constant, the animal growing weaker, the partial spasms becoming less, and the general spasms more marked.

65 m. Noise in throat ceases. Breathes quietly.

80 m. Spasms very feeble. Respiration convulsive, with a gurgling noise at each breath.

82½ m. Spasms ceased. Gasps. Ten respirations per minute, and growing less frequent.

84 m. Dies.

Autopsy, twelve hours after death. The body was kept in the interval on an inclined plane, prone, with the head elevated. Mucous membrane of the œsophagus white, hard, and wrinkled longitudinally. So firmly were the walls of the œsophagus contracted in its central portion, that a small probe could be with difficulty introduced. Stomach filled with food. Mucous membrane eroded in irregular patches, with hard, dark margins. Some portions simply reddened, others hardened, wrinkled, and turned white. Intestines unaffected. Heart, left side filled with black blood, right side nearly empty. Trachea somewhat reddened. Lungs healthy. Kidneys very highly engorged with blood. Brain normal. All parts of the body smell strongly of the acid.

Experiment IV. Mouse. Two-thirds of a minim of the liquid acid was dissolved in water, and injected into the rectum. Ran rapidly around for a few seconds, and then remained quiet.

1½ m. Trembles violently. Crouched down on belly. Cannot stand.

2 m. Still trembling. Conjunctiva insensible. Totally unconscious.

3 m. Lying on one side in rapid convulsions, similar to those described in the previous experiments, but more rapid.

4 m. Movements growing more feeble and less frequent.

5½ m. Movements ceased. Only gasps.

6 m. Dies.

Autopsy, immediately. Opened thorax. Heart pulsated feebly, perhaps from being twitched with the point of the knife. Ceased immediately to respond to such stimulus. No morbid appearances.

Experiment V.—Mouse. One-fourth of a minim of the pure acid was injected under the skin.

1½ m. Trembles slightly.

2½ m. Trembles violently. Remains on its feet and is conscious.

2¾ m. Falls on side in convulsions. Conjunctiva still sensible.

5 m. Conjunctiva insensible. Convulsions very rapid.

20 m. A little weaker; otherwise as before.

22 m. Seems struggling to rise. Consciousness returning.

25 m. Tries to walk when placed on feet, but cannot stand long.

28 m. Squeals. Tries to escape from a touch, but does not appear to see. Less control over the hind than the fore-legs. Whirls around when trying to advance.

60 m. Squeals almost constantly.

75 m. Spasms ceasing. Only trembles. Is able to stand and walk.

90 m. Falls over on side, and cannot rise. Left struggling.

135 m. Found apparently well, but rather dull.

245 m. Well as ever. Has been eating meal and drinking water.

Experiment VI.—Same mouse, sixteen hours after previous experiment. Injected ½ minim dissolved in water, under the skin. Death took place in 30 minutes, with symptoms precisely like those detailed in the other cases. Autopsy immediately. No morbid appearances of note. Heart responds to irritation, throbbing under it for five minutes after death.

The remaining experiments, eight in number, developed nothing of importance that had not been exhibited by the others. In one case the heart was observed to throb for several seconds after all other motions had apparently ceased. In several instances there was found a post-mortem congestion of the kidneys, and in one the bladder was distended with urine. The cerebral and spinal meninges often appeared engorged to an unnatural extent, but in no other case was this condition nearly as strongly marked as in Experiment II.

Remarks on the Experiments.—Although the observed effects of a drug upon the lower animals are not always precisely *identical* with those on man, yet we seldom see any very wide discrepancy. It will be noticed that there is a striking similarity between the results of the experiments and the reported cases. One doubtful point may be considered as settled by the former, and that is, that carbolic acid produces convulsions when taken in poisonous doses.

IV. ANTIDOTES.

In the treatment of poisoning with carbolic acid, we are obliged to rely chiefly upon measures of evacuation and stimulation. There is no known chemical antidote of value. Owing to its weak affinities, the acid forms no stable chemical combination. The white of eggs, milk, and flour paste are of some use, serving, in a measure, to prevent the rapid absorption of the poison, and giving time for evacuation. When the strong acid has been taken into the stomach, the œsophagus is usually so contracted as to make the use of emetics and the pump difficult—or impossible. In case of rectal poisoning, too much importance cannot be attached to the rupture of the sphincter ani. This measure of treatment was, as far as I am aware, first recommended to the profession by my eminent friend, Prof. H. R. Storer, M.D.,

* This animal seemed dull and exhausted when the poison was administered. He may have been injured about the head and neck in the trap, although no marks of violence appeared either externally or under the skin of those regions. Owing to this uncertainty, however, I have attached less weight to the morbid appearances after death than I otherwise should.

of Boston. The general symptoms may be combated by ammonia, camphor, musk, and other stimulants of like nature, and by friction, and dry heat. Chloroform, morphine, and belladonna only render death more speedy and certain. This is without doubt true of the other powerful neurotics. There is probably no specific dynamical antidote for carbolic acid, if, indeed, there is such an antidote for any poison. After the general symptons have passed away, brandy, nourishing food, and local, antiphlogistic measures may be resorted to, if necessary.

V. MEDICO-LEGAL EVIDENCES OF POISONING WITH CARBOLIC ACID.

These may be enumerated as follows:—

1. The defection of the poison in the body by physical and chemical tests.

2. The nature of the symptoms and post-mortem appearances.

3. The preservation of the body.

The detection of the poison in the body is the only conclusive evidence in itself of poisoning with carbolic acid. As we have seen before, this is no easy task in many instances. The odour of the acid about the body would be likely to direct attention to it, especially if a large quantity had been used. Of the symptoms, the most distinctive are the profound insensibility, trembling and muscular spasms, and the great prostration. The post-mortem appearances, other than the local, are of little value. The preservation of the body is a point of considerable importance. It has been fully shown by competent observers, that, when the surface of a corpse is washed, and the natural cavities injected with carbolic acid, the process of decay is prevented. If the acid were actually taken into the circulation, and carried into every tissue of the body, its effect could hardly be less striking. One of the mice poisoned three weeks ago with one minimum of carbolic acid has been kept since then in the house in a warm place, and there is now no sign whatever of putrefactive change. Preservation of the body would therefore be strong presumptive or confirmatory proof of the poisoning by carbolic acid.

RECAPITULATION OF LEADING POINTS.

1. Carbolic acid is a dangerous poison.

2. It is rapidly absorbed into the system.

3. It is rapidly eliminated from the system, chiefly by the kidneys, but probably, to some extent, also by the other emunctories.

4. The local action of the poison is that of a caustic irritant and sedative.

5. Its general action is that of a powerful neurotic, causing trembling convulsions, giddiness, headache, insensibility, a cold clammy surface, a feeble, intermittent, rapid pulse, great prostration, death.

6. Recovery in non-fatal cases is speedy and complete, when there has been no serious local lesion.

7. The post-mortem appearances are neither constant nor distinctive.

8. There is no known chemical or other antidote of value.

9. In treatment the chief reliance must be placed upon measures of evacuation and stimulation.

10. Aside from the actual detection of the poison in the body, preservation of the body is the most important medico-legal evidence of poisoning with carbolic acid.

A SURGEON'S TESTIMONY.

OUR attention has just been called to the reports of an inquest held at Old Ford before Mr. Richards, deputy coroner, touching the death of a child named Frederick Henry Robinson. Though eight weeks have elapsed since the termination of the inquiry, our readers will thank us for giving them an abstract of the proceedings.

According to the evidence of the parents, the deceased child was eleven months old, and was not suffering from dentition at the time of his death. They had given him some medicine supplied by Mr. Burleigh, a chemist in Bow, and subsequently three doses of a mixture obtained from Mr. S. Dean, another chemist, carrying on business at 320, Roman-road, Bow. The child had caught cold, and for some weeks had been suffering from what the parents described as a "catching of the breath." On Sunday morning, the 6th of December, about half-an-hour after he had taken the third dose of Mr. Dean's mixture, he had a bad fit of the breath-catching which led to his death. Mr. George Eveleigh, M.R.C.S., who was called in, fancied he detected symptoms of poisoning by belladonna or aconite, and stated that it was the third or fourth case of such poisoning that had come under his observation. A *post-mortem* examination was made by Mr. Eveleigh alone, and in his evidence before the coroner he gave the cause of death as "want of action of the heart, caused, he believed, by poisoning by belladonna or aconite." The coroner, thereupon, adjourned the enquiry, in order that the medicine and the contents of the stomach might be analysed.

Mr. Dean, seeing the serious nature of the accusation thus indirectly brought against him through the unsupported testimony of a surgeon who had only been resident in the neighbourhood for a few months, lost no time in making arrangements for a re-examination of the body. Accordingly at his request, and with the coroner's consent, Dr. Woodforde, the Medical Officer of Health for the Poplar District, and Mr. C. E. Garman, M.R.C.S.E., of Bow-road, made a most careful re-examination of the body, at which Mr. Eveleigh was present, and the report on the *post-mortem* appearances given by these two gentlemen of undoubtedly high position and standing in the profession, differed in many respects from that of Mr. Eveleigh, the conclusion arrived at being thus expressed: "In our opinion the symptoms during life, and the *post-mortem* appearances, point to 'Spasmodic Croup' as the cause of death, and are not consistent with the theory of poisoning by belladonna."

At the adjourned inquest held on the 21st of December, Dr. Tidy, chemical analyst to the London Hospital, deposed that he had made a most careful analysis of the mixture remaining in Mr. Dean's bottle, and had found it to be an ordinary fever mixture containing nothing poisonous. An analysis of the contents of Mr. Burleigh's bottle led to results which were likewise inconsistent with the theory that the child had been accidentally poisoned by the medicine which had been administered to him. Dr. Tidy also stated that he had examined the stomach systematically with a view of detecting the presence of mineral or organic poisons, but had found in it no traces of poison.

Dr. Woodforde and Mr. Garman deposed that they had very minutely examined the body, and found not the slightest appearance that could lead to the supposition that the child had been poisoned by belladonna, or any other poison. They had failed to detect the signs of "inflammatory action" mentioned by Mr. Eveleigh, and had not found the pupil of the eye dilated.

Mr. Eveleigh, after an unprofessional attempt to shake the evidence of Mr. Garman, contended that he did not mean to accuse Mr. Dean of giving belladonna to the child. He said the poison might have got into the corn-flour, as he knew that that article was carelessly prepared, and in the course of his travels in foreign parts *he had frequently seen belladonna berries gathered with the maize.*

Mr. Dean produced his day-book to show that the medicine he gave Mr. Robinson, the father of the child, was as follows:—Bicarbonate of potash, half a drachm; antimonial wine, 1 drachm; sweet spirits of nitre, 1 drachm; and syrup of saffron, 1 drachm; making the mixture an ounce and a half with water. He wished to say that his poisons were kept quite separate from the ordinary drugs, and that, therefore, a mistake could not be made in what was given.

Mr. Robinson, the father of the deceased, complained bitterly of the inconsiderate conduct of Mr. Eveleigh when making the *post-mortem* examination.

The coroner having summed up the evidence, the jury returned the following verdict:—"That the child died from spasmodic croup from natural causes; and they state that the conduct of Mr. Eveleigh was most reprehensible, and advise him to act with caution in the future; and they see nothing to remove Mr. Dean from the very high position he has maintained in the confidence of the neighbourhood."

Mr. Eveleigh said he still adhered to his opinion that the child died from belladonna, though he could not say by whom or how it was administered.

The coroner remarked upon the evidence given by Dr. Tidy, and the two medical gentlemen who had made the *post-mortem* examination, giving it as his opinion that their evidence was conclusive. He then proceeded to censure Mr. Eveleigh, and said, "If you still adhere to your opinion I should be very sorry to place myself under your hands."

SOCK AND SHIRT POISONING.

THE following communication from Mr. J. A. Wanklyn, Professor of Chemistry in the London Institution, appears in a recent number of the *British Medical Journal*:—

In common with a large section of the daily press, the *British Medical Journal* has called attention to the risks attendant on the use of poisonous hair-dyes. The danger arising from wearing next the skin articles of clothing impregnated with poisonous dyes is a much graver matter, in comparison with which all the risks run by persons who dye their hair sink into insignificance. The brilliantly coloured socks, flannel shirts, etc., which are now so very common, are a source of danger; for the risk of absorption of poison from a shirt is in itself much greater than the risk of absorption of poison from the hair of the head, and the wearing of coloured shirts is an infinitely commoner thing than the use of hair-dye is ever likely to become. The coal-tar dyes, to which we are indebted for the brilliant colours of the garments in question, are poisonous. Magenta, the well-known red dye—which is, moreover, the basis of beautiful violets and blues, that are prepared from it by well-known processes—is of arsenical origin. All the magenta made at the present time, and, with a very insignificant exception, all the magenta which has ever been manufactured, is a product of the action of arsenic acid on commercial aniline. At first, and, indeed, even when the manufacture had become largely developed, the dye was sent into the market in a highly arsenical condition. In 1863, I examined beautiful crystals of magenta, samples of the dye produced by a very large continental firm, and found them to contain something like 25 per cent. of arsenic acid. Many tons of solid dye, such as that which I analysed, found their way into the market. At the present time, it is unlikely that much magenta of this quality is manufactured; but it is in the highest degree improbable that any magenta is quite free from arsenic, and more than probable that some of the varieties which are manufactured contain a very considerable quantity. In fine, we are justified in regarding fabrics which are dyed with magenta as having been more or less impregnated with arsenic. On the other hand, it will be urged that there can be no absorption of arsenic from a fabric dyed with magenta, inasmuch as the arsenic is chemically combined with the dye-stuff, which, with the fibre coloured by it, constitutes an insoluble compound, and is, therefore, out of the reach of the process of absorption. Unfortunately, however, magenta fades, and is fugitive; it is, in fact, one of the least permanent of all the coal-tar colours; and, as the organic part of the dye decays, the arsenic will be set at liberty, and presented in a form most suitable for absorption. In addition to the possibility of arsenical poisoning from the employment of coal-tar colours, there are other varieties of poisoning to be apprehended. The organic part of these new dyes is unquestionably more or less poisonous. One of the yellow dyes, in particular, is said to be an irritant of a most formidable character. On this subject, and with the object of opening the eyes of the public, I cannot, perhaps, do better than quote what has been said by a manufacturer when reproached with the poisonous nature of his dyes: "They are not more poisonous than arsenic." As a set-off against the fact that the dyes are powerfully poisonous, must be placed the equally certain fact that the quantity of dye-stuff taken up by a shirt is very small. Whilst deprecating any degree of public excitement on this subject, I would urge the necessity of having the whole subject investigated. Possibly the result of investigation may be, that the risk of sock-and shirt-poisoning is small—something like the risk of railway-travelling; possibly, however, the reverse; and possibly we may have to abandon the use of coal-tar dyes for the colouring of such articles of clothing as are to be worn in immediate contact with the skin.

HOW GLASS BOTTLES ARE MADE.

IN an article upon the manufacture of glass-ware at Pittsburgh, the *Scientific American* thus describes the blowing of bottles:—

The chief instrument used in the blowing of bottles, as well as all other glass-blowing, except fancy glass ornaments and toys, to be described subsequently, is what is technically known as the "pipe." It is a wrought-iron tube, from four to five feet long, with a small knob at one end, and a wooden handle at the other, terminating in a mouth-piece through which the air is forced; the bore extending entirely through the instrument. The end upon which the knob is fixed is used to collect a mass of the fused glass, to be fashioned into a bottle. With this simple instrument, the workman approaches the "working hole" of the furnace, plunges the end into the fused glass, and, rolling it around, collects a ball of the material, and, immediately withdrawing it, blows a slight blast through the tube, which expands a small hollow in the mass. After the ball has cooled a little, he plunges it in a second time, thus accumulating more material, and repeats this process until sufficient material has been taken up. As soon as the ball is large enough, it is brought into one of the hollows of the "marver"—a wooden block, in which hemispherical concavities have been excavated, the hollows being kept moistened with water. The mass is rotated in one or more of these cavities, while a gentle blast is forced through the tube to keep open the internal opening. After a little, the plastic mass assumes the form of a pear. This pear is now subjected, after reheating in the working hole, to a complex manipulation. It is elongated by the swinging

of the pipe to and fro, like a pendulum, the centrifugal force thus generated stretching it out longitudinally, and, at the same time, it is kept round by turning the tube on its major axis, and expanded by a stronger blast than heretofore. By these means combined, the metal assumes the form of an egg, with a long tubular neck extending from the smaller end. As soon as this stage in the process is reached, the vessel is inserted into the mould—a block of iron, containing a cylindrical hole the size of the desired bottle,—and expanded to fit it by a strong blast, at the same time its neck is elongated by a succession of jerks, the inertia of the body of the bottle being sufficient for the latter purpose. By this time, the yet unfinished bottle is so cool that a reheating is necessary. This time, however, the bottom only is heated, in order to give it the requisite concavity. As soon as it acquires enough plasticity, an assistant—usually a boy,—who has, in the meantime, attached a small mass of fused glass to a rod of iron called a "punty," places this instrument with its little ball of glass as near the centre of the bottom as possible, and presses it inwards. As soon as the bottom becomes cool, the bottle is detached from the pipe by dropping a little cold water upon the neck as near the pipe as possible. This cracks it short off, and the bottle is now supported by the punty attached to the bottom. The neck is now reheated, and a thread of hot glass wound around it at the top to form the rim, and a finish is given to it by rotating it; the punty resting across the edge of a bench upon which the workman is seated, who, while rotating the bottle, applies an iron instrument to the yet plastic glass. A boy then seizes the punty, and carrying the bottle to the annealing oven, detaches it by a quick jerk. This completes the work on an ordinary champagne bottle.

The process we have described is varied in some particulars in making other kinds of bottles, for perfumers, druggists, etc. We have often heard people express wonder that letters, panels, figures of animals, and other ornaments could be blown in the sides of bottles, but it is the simplest thing imaginable. The letters or other designs are cut in the side of the mould, which for fine work is generally made in halves, and so adjusted that it can be opened or closed by a foot lever. The moulds for such work are also formed so that the top closes, with the exception of an aperture for the neck. The glass having been blown into a pear-shaped ball of the right size, is placed in the mould and a sharp blast forces it into every depression.

"CHEMIST BY EXAMINATION."

THE assumption of this title by a chemist and druggist who has merely passed the "Modified Examination" of the Pharmacy Act is the subject of a series of letters published by the *Brighton Daily News*. One of the letters is signed by a gentleman whose opinions have great weight, and we have much pleasure in reprinting it in these columns:—

"SIR,—Some few years ago a number of those engaged in pharmacy enrolled themselves into a voluntary association. Its first object was educational, for they felt that the pursuits in which they were occupied rendered a higher training necessary than that required by a mere trade, however honourable. Moreover, it was apparent that their business interests would be best consulted by introducing technical knowledge into their daily avocations, a point which has, of late years, received abundant confirmation. Its second aim was to unite men possessing a common interest in one brotherhood of thought and action. The movement grew, spread, and developed. Lectures were inaugurated; evening meetings were consecrated to science; and social gatherings kept up in the spirit of the word society. Soon, as a necessary consequence, museums were created, and a library arose, that best infallible index of mental resurrection. Working out the law of progress, this association, still voluntary, obtained a charter which, on definite conditions, bestowed a title, and this was to be gained by a curriculum of study, tested, at intervals, by examinations, which were—1, Classical; 2, the Minor; 3, the Major—terms which require no explanation. But as no law can be promulgated which does not recognise existing rights, those who had been pharmacists before a date specified were allowed the same title as their due. Many of these were (and some of them, happily for us, remain) the ornaments of that pharmacy whose examinations they could not pass, simply because their claims were antedated. Some of our most competent examiners at this moment are the representatives of this class. Others (possibly not a few) gained a title to which their long connection with trade pharmacy was their best recommendation. Yet, inasmuch as there does exist among our ranks a set of men worthy of all honour, distinguished equally by scientific acquirement, social standing, and commercial reputation, it has always been considered a thing of questionable delicacy to see placarded over a pharmacy or printed on a label 'Pharmaceutical Chemist by Examination,' betraying on the part of the individual not so much the wish to intimate superiority to those whose names are household words, but that the position he enjoys is held so feebly that he is content even to risk the ridicule such an assertion would involve.

"This year the society representing British pharmacy has entered on a new phase of existence; its long-anticipated destiny has been accomplished, so far as it has been placed under legal sanction, and its examinations have been made compulsory. Let no one think that its recent regulations are those which will ultimately determine its constitution, or that time will not suggest many changes before we may congratulate ourselves on the final settlement of an amended Act. To effect this change, once more the same precautions had to be observed, in order to secure vested interests. On and after the 1st of January, 1839, the doors of pharmacy wer closed for ever against all who may not hereafter be duly qualified by passing three prescribed examinations, which they will be scarcely able to accomplish without a previous liberal education and a course of systematic study. It would have been a gross wrong to have forbidden assistants of a certain standing to commence business on their own account unless they had complied with these Government enactments. On their behalf a compromise was made—neither on the one hand were they to become chemists unexamined; nor, on the other, was the test to be so severe as to be practically unavailing. This compromise, honourable alike to the examiners and the examined, was the modified examination. Its main requirements are as follows:—

"1. To read Latin prescriptions fluently, to translate them accurately, and to detect unusual doses.

"2. To recognise such objects of materia medica and chemical and pharmaceutical preparations as commonly occur in trade.

"3. To recognise seven medicinal plants out of other specimens, and to answer questions in elementary botany.

"4. To dispense rapidly, intelligently, and well.

"5. In case of powerful remedies, to be familiar with the proportions of the active ingredients.

"This specially relates to arsenic, mercury, opium, and strychnine. Whoever faithfully undergoes this examination is competent to discharge the duties and to accept the responsibilities which the vocation of pharmacy entails, and his qualifications are formally accredited. And having heartily made this acknowledgment, I am left free to state that which is well known to every pharmacist. Such a test of qualification is essentially a pass. It is held in scanty favour by the majority of the examiners: it cannot be estimated at the same value as the Minor and the Major, which demand chemical, pharmaceutical, botanical, and practical knowledge of the highest order; but by the wording of the Act it grants the title of chemist, which most undeniably is by examination. Let this title be fairly and legitimately used, and he will not complain either of want of respect on the part of his companions or want of confidence from the public. But whenever and however the title of "Chemist by Examination," gained by the *modified*, leads the world outside to infer superior attainment, it conveys a

false impression. Let us rejoice that the working of the new Act will eventually render these disputed points impossible. Our children, not ourselves, will reap the full advantage of its provisions—not one of the least of which will be, that the actual possession of a pharmacy will be a guarantee that the owner is a thoroughly-skilled chemist, and a well-educated gentleman.

"JOSEPH INCE,
"M.P.S. by Examination, and one of the Examiners)."

COLOURS FOR SHOW BOTTLES.

THE Editor of the *Canadian Pharmaceutical Journal*, addressing "a Beginner," writes:—

We append the forms you desire, and would remark that the beauty of a show carboy depends on clearness, as well as colour—no sediment should appear at the bottom of the bottle; and to guard against this, the mixture should be made a day or two before required, and then carefully filtered. With regard to the amount of alcohol necessary to prevent freezing, it is usual to use it about the strength of proof, but a strength of 30 u.p. is quite sufficient—so make five gallons of this degree, about two gallons of ordinary alcohol must be mixed with three gallons of water. When made with alcohol alone, the colours appear brighter; but some danger is incurred from the vicinity of lighted lamps. We prefer rather pale colours, but as this is a matter of taste, we merely give the ingredients necessary to produce the colour, leaving the quantity to be used to your own judgment.

RED.

I. Liquid magenta dye—q. s.

This is a good colour, stands well, and can be easily deepened by the addition of a little more magenta.

II. Iodine, 1 part; potass. iodid., 1 part. Dissolve in a little alcohol, and use as required.

III. Dissolve cochineal in liq. ammonia, by the aid of a gentle heat. This produces a fine colour, but liable to fade.

PURPLE.

Plumbi acetas, 24 parts; cochineal, 1 part.

PINK.

Cobalt. nitras; ammon. carb. (in excess). This is a very pretty colour.

YELLOW.

I. Potas. bichrom, 6 parts; potas. carb., 4 parts.

II. Potas. chromas q. s. Both these are good and permanent colours.

CANARY.

Picric acid dissolved in a little alcohol.

ORANGE.

Potas. bichrom., q. s. Acid sulph. deepens the colour.

GREEN.

Dissolve a few copper coins in nitric acid. Very permanent.

EMERALD GREEN.

Nickel, dissolved in dilute sulphuric acid, by heat. A very beautiful and permanent colour.

BLUE.

Cupri sulph., 2 parts; acid sulph., 1 part.

ROYAL BLUE.

Cupri sulph. Dissolve, and add liq. ammon. to the required shade.

AMATEURS IN PHYSIC—CARBOLIC ACID.

THE comments of the *Lancet* upon a curious correspondence which lately appeared in the columns of the *Times* may be fitly reproduced here. After remarking that the correspondence referred to would be amusing if it were not a little too serious, our contemporary proceeds as follows:—

Mr. Le Neve Foster trusted that he might "not be considered out of place in drawing attention to a means of alleviating" scarlatina and typhus. He professed himself to be "well aware how delicate a thing it is for a layman to meddle in matters of medicine;" and, after this introductory flourish, proceeded to prescribe poisonous doses of carbolic acid. Fortunately, Dr. Beale and Dr. Fuller noticed the letter, and the quantity of the acid, and they wrote to the *Times* to say what the effect of Mr. Foster's prescription would be. He replied by a letter that is as delicious a specimen of sciolism and self-sufficiency as we have ever witnessed, and that fully deserves to be reproduced.

"I am greatly obliged," he writes, "to Dr. Beale and Dr. Fuller for drawing attention to a very possible misinterpretation of my description of the preparation of carbolic acid to be used as a medicine. I used the words 'concentrated medicinal carbolic acid,' by which it is hardly necessary to say I did not mean the 'concentrated acid,' to which, as far as I am aware, the term 'medicinal' has never been applied. I referred to what is sold by chemists under the title of 'solution of best medicinal carbolic acid.' This is the solution to be diluted with ten parts of water, and when thus diluted the dose I named was one teaspoonful. I need scarcely add that these doses should be given with some discretion, and should not be continued indefinitely; probably three doses are the most that should be given, especially to children. Doses of even still greater dilution I am told are efficacious."

It seems inconceivable that Mr. Foster should not know that the only "carbolic acid" that can be called "medicinal" is the pure carbolic acid—the preparation ordered in the British Pharmacopœia—the maximum dose of which for an adult is three grains. What in the world does he mean by "what is sold by chemists under the title of solution of best medicinal carbolic acid?" and what is to prevent any chemist from making and selling any solution that he pleases? What does Mr. Foster mean by "concentrated" carbolic acid? Carbolic acid may be diluted, but how can it be concentrated? This sort of stuff is like the talk of a monthly nurse; and, until the Secretary of the Society of Arts can write with more exactness, he should refrain from writing about active poisons. A man who lately drank some carbolic acid died in eight minutes from its effects. The question of its use in medicine is at present *sub judice*, and is being carefully and rationlly investigated by persons able to deal with it.

CHARCOAL RESPIRATORS.

BY WILLIAM MARCET, M.D., F.R.S.

(Assistant-Physician to the Hospital for Consumption.)*

I HAVE been recommending the use of charcoal respirators to sufferers from phthisis, and (as a rule) from inflammatory affections of the lungs and air-passages (larynx and pharynx); and these patients have undoubtedly derived benefit from this very simple means of protection against the admission of impure and cold air into their lungs.

The property of charcoal of acting as a sieve for the removal of fine particles of dust or other mechanical impurities contained in it, is, I believe, not so generally known

* Communicated to the *Brit. Med. Jour.*, January 23.

or acknowledged as its power of purifying air from any gaseous contamination. I had an opportunity some years ago, when assistant-physician to the Westminster Hospital, of judging of the value of charcoal as a means of purifying air from the very finest dust. On this occasion, a chaff-cutter applied to me to be treated for chronic bronchitis of a severe form. He complained of the dust, which he was constantly breathing while at work, causing much irritation in the chest. It then occurred to me that, by wearing a charcoal respirator, my patient might be saved from the obvious cause of his illness. Having procured one of these respirators, made so as to protect both mouth and nose, I went to see the man at work. He was enveloped in a cloud of dust, mostly of the finest description, which was accumulating about the room to a considerable depth. On my standing close to the chaff-cutter, I was actually suffocated by the dust; but, from acquired habit, he could bear it. I then put on the respirator, and was astonished at finding that, in the thickest of the dust, I could breathe as freely and as comfortably as in pure air. The man took to wearing the respirator when chaff-cutting, and often since then gratefully acknowledged the benefit which he derived from it.

It is hardly necessary to insist on the importance of preserving diseased lungs from solid particles suspended in the air which is breathed. I need only remark that, especially in large towns, minute particles of various substances are constantly floating about in the air; and that they must be a constant cause of irritation, from which it is important to preserve inflamed or otherwise affected organs of respiration.

With respect to air contaminated with foreign gases, these may act either as a source of irritation to the lungs or throat, or be taken up into the blood through the lungs, interfering with the already reduced power of nutrition.

Charcoal retains a certain proportion of the heat of the expired air, imparting warmth to that which is taken into the lungs.

A number of my patients attending the Consumption Hospital, Brompton, have been wearing charcoal respirators of a rough construction, from which they derive relief and comfort. Mr. Rooff, of 7, Willow Walk, Kentish Town, has made, at my request, an improved charcoal respirator, which is inexpensive, and will, I think, be found to answer its purpose quite satisfactorily.

The following extract from Watts's *Dictionary of Chemistry* bears directly on this subject:—"Wood-charcoal and other porous forms of carbon have the property of absorbing large quantities of gases. . . . This property of charcoal has been applied by Dr. Stenhouse to the construction of ventilators and respirators for purifying infected atmospheres. In a pamphlet bearing the title *On Charcoal as a Disinfectant*, Dr. Stenhouse observes: "Charcoal not only absorbs effluvia and gaseous bodies, but, especially when in contact with atmospheric air, rapidly oxidises and destroys many of the easily alterable ones."

MICHAEL FARADAY.

BY DR. H. BENCE JONES, F.R.S.*

Æt. 1 *to* 12 (1791 *to* 1804).

MICHAEL FARADAY was born in the working class, of a very religious family. For two generations at least those who preceded him showed the extreme views in favour of toleration and disestablishment which caused, first, the deposition of the Rev. John Glas, and afterwards the secession of his son-in-law, R. Sandeman, from the Presbyterian Church of Scotland. That the revealed will of Christ should be the supreme and only law, not only in all church questions, but in every thought and word and deed, was the belief of those who were nearest to Faraday in his infancy; and this he held throughout his life, as though it had been a special revelation to himself.

His father, James, was the third of ten children born at Clapham in Yorkshire. He was a blacksmith; his eldest brother worked as slater, grocer, and millowner; another brother was a farmer, another a packer, another a shopkeeper, and the youngest a shoemaker. Another of the brothers died young, in the year Michael was born; and a letter from the mother of the young man shows the strength of the religious feeling in mother and son.

When twenty-five, in 1786, James Faraday married Margaret Hastwell, daughter of a farmer near Kirkby Stephen. Soon after their marriage they came to Newington in Surrey, where Michael, their third child, was born, September 22, 1791, in a house probably long since pulled down. The father obtained work at Boyd's in Welbeck-street; and when Michael was about five years old, after living a short time in Gilbert-street, they removed to rooms over a coach-house in Jacob's Well Mews, Charles-street, Manchester-square. The home of Michael Faraday was in these mews for nearly ten years; and his family remained there until 1809, when they moved to 18, Weymouth-street.

Faraday has himself pointed out where he played at marbles in Spanish-place, and where, years later, he took care of his little sister in Manchester-square. He says, "My education was of the most ordinary description, consisting of little more than the rudiments of reading, writing, and arithmetic, at a common day-school. My hours out of school were passed at home and in the streets."

Only a few yards off was a bookseller's shop, No. 2, Blandford-street; there, as a boy of thirteen, in 1804, he went on trial for a year to Mr. George Riebau. Once when walking with a niece they passed a little news-boy, when he said, "I always feel a tenderness for those boys, because I once carried newspapers myself.

Æt. 13 *to* 19 (1805 *to* 1811).

On the 7th of October, 1805, when fourteen, Faraday was apprenticed; and, in consideration of his faithful service, no premium was given to Riebau.

Four years later his father wrote (in 1809), "Michael is bookbinder and stationer, and is very active at learning his business. He has been most part of four years of his time out of seven. He has a very good master and mistress, and likes his place well: he had a hard time for some while at first going; but, as the old saying goes, he has rather got the head above water, as there is two other boys under him."

Faraday himself says, "Whilst an apprentice I loved to read the scientific books which were under my hands, and amongst them delighted in Marcet's 'Conversations on Chemistry,' and the electrical treatises in the 'Encyclopædia Britannica.' I made such simple experiments in chemistry as could be defrayed in their expense by a few pence per week, and also constructed an electrical machine, first with a glass phial, and afterwards with a real cylinder, as well as other electrical apparatus of a corresponding kind." He told a friend that Watts on the Mind first made him think, and that his attention was turned to science by the article "Electricity" in an encyclopædia he was employed to bind.

"My master," he says, "allowed me to go occasionally of an evening to hear lectures delivered by Mr. Tatum in natural philosophy at his house, 53, Dorset-street, Fleet-street. I obtained a knowledge of these lectures by bills in the streets and shop-windows near his house. The hour was 8 o'clock in the evening. The charge was 1s. per lecture, and my brother Robert (who was three years older and followed his father's business) made me a present of the money for several. I attended twelve or thirteen lectures between February 19,

* Extracted from the *Proceedings of the Royal Society*. It is introduced by the following note:—"An account of 'Faraday as a Discoverer' having been already given to the world by one eminently qualified for the task, it has been deemed advisable in this place to give a narrative of the chief events of his personal history, with such indications of his character and opinions as may be read in his written correspondence and private memorials. This service has been kindly rendered by Dr. Bence Jones, F.R.S., Secretary to the Royal Institution, the devoted friend of Faraday, in whose hands have been placed the letters and manuscripts from which the substance, and, for the most part, the words of the present notice have been taken.—W. S., Sec. R.S."

1810, and September 26, 1811. It was at these lectures I first became acquainted with Magrath, Newton, Nicol, and others."

He learned perspective of a Mr. Masquerier, that he might illustrate these lectures. "Masquerier lent me "Taylor's Perspective," a 4to volume, which I studied closely, copied all the drawings, and made some other very simple ones, as of cubes or pyramids, or columns in perspective, as exercises of the rules. I was always very fond of copying vignettes and small things in ink; but I fear they were mere copies of the lines, and that I had little or no sense of the general effect and of the power of the lines in producing it." How he was educating himself at this time and the subjects that interested him, may be seen in a manuscript volume (a shadow of the future) which he called "The Philosophical Miscellany, being a collection of notices, occurrences, events, &c., relating to the arts and sciences collected from the public papers, reviews, magazines, and other miscellaneous works. Intended," he says, "to promote both amusement and instruction, and also to corroborate or invalidate those theories which are continually starting into the world of science. Collected by M. Faraday, 1809-1810."

In 1811 (æt. 19) he became acquainted, at Mr. Tatum's, with Mr. Huxtable and Mr. Benjamin Abbott; the first was a medical student, the other, who belonged to the Society of Friends, was employed in a house of business in the city.

Mr. Huxtable lent him Parkes's "Chemistry," which Faraday bound for him, and the third edition of Thompson's "Chemistry."

Æt. 20 (1812).

Among the few notes Faraday made of his own life are the following:—

"During my apprenticeship I had the good fortune, through the kindness of Mr. Dance, who was a customer of my master's shop, and also a member of the Royal Institution, to hear four of the last lectures of Sir H. Davy in that locality [he always sat in the gallery over the clock.] The dates of these lectures were February 29, March 14, April 8 and 10, 1812. Of these I made notes, and then wrote out the lectures in a fuller form, interspersing them with such drawings as I could make. The desire to be engaged in scientific occupation, even though of the lowest kind, induced me, whilst an apprentice, to write, in my ignorance of the world and simplicity of my mind, to Sir Joseph Banks, the President of the Royal Society. Naturally enough, 'No answer,' was the reply left with the porter."

On Sunday, July 12, 1812, three months before his apprenticeship was over, he wrote the first of a series of letters to his friend Mr. Benjamin Abbott (who was a year and a half younger than himself), from which a full view can be gained of what he was by nature, and what his self-education at this time had made him.

"I have lately made a few simple galvanic experiments merely to illustrate to myself the first principles of the science. I was going to Knight's to obtain some nickel, and bethought me that they had malleable zinc. I inquired and bought some; have you seen any yet? The first portion I obtained was in the thinnest pieces possible,—observe, in a flattened state. It was, they informed me, thin enough for the electric smoke, or, as I before called it, De Luc's electric column. I obtained it for the purpose of forming discs, with which and copper, to make a little battery. The first I completed contained the immense number of seven pair of plates!!! and of the immense size of halfpence!!!!!! I, sir, I, my own self, cut out seven discs of the size of halfpences each! I, sir, covered them with seven halfpence, and I interposed between seven, or rather six, pieces of paper soaked in a solution of muriate of soda!!! But laugh no longer, dear A., rather wonder at the effects this trivial power produced; it was sufficient to produce the decomposition of sulphate of magnesia, an effect which extremely surprised me." And then he describes how he built up a larger battery, and obtained greater and further effects, and reasons on the results, and urges his friend to think of these things, and "let me, if you please, sir, if you please let me know your opinion." On the Monday he adds a postscript: "I am just now involved in a fit of vexation. I have an excellent prospect before me, and cannot take it up for want of ability. Had I perhaps known as much of mechanics, mathematics, mensuration, and drawing as I do perhaps of some other sciences—that is to say, had I happened to employ my mind with these instead of other sciences—I could have obtained a place, an easy place, too, and that in London, at 5,' 6', 7', £800 per annum. Alas! alas! Inability. I must ask your advice on the subject, and intend, if I can, to see you next Sunday; one necessary branch of knowledge would be that of the steam-engine, and, indeed, anything where iron is concerned."

In his next letter he says, speaking of fresh experiments with his battery, "I must trust to your experiments more than my own; I have no time, and the subject requires several;" and in a letter written August 11, "Pyrotechny is a beautiful art, but I never made any practical progress in it, except in the forming a few bad squibs; so that you will gain little from me on that point."

In his next letter (August 19) he says, "I cannot see any subject except chlorine to write on. Be not surprised, my dear A., at the ardour with which I have embraced this new theory. I have seen Davy himself support it. I have seen him exhibit experiments (conclusive experiments) explanatory of it; and I have heard him apply these experiments to the theory, and explain and enforce them in (to me) an irresistible manner. Conviction, sir, struck me; and I was forced to believe him, and with that belief came admiration."

In a letter dated about a fortnight before his apprenticeship was out he writes, "Your commendations of the MS. lectures [of Davy] compel me to apologize most humbly for the numerous (very, very numerous) errors they contain. If I take you right, the negative words 'no flattery' may be substituted by the affirmative 'irony;' be it so, I bow to the superior scholastic erudition of Sir Ben. There are in them errors that will not bear to be jested with, since they concern not my own performance so much as the performance of Sir H., and those are errors of theory; there are, I am conscious, errors in theory, and those errors I would wish you to point out to me before you attribute them to Davy."

In the last letter before the great change came (October 1, 1812), he says, "I rejoice in your determination to pursue the subject of electricity, and have no doubt that I shall have some very interesting letters on the subject. I shall certainly wish to (and will if possible) be present at the performance of the experiments; but you know I shall shortly enter on the life of a journeyman, and then I suppose time will be more scarce than it is even now."

On the 8th of October he went as journeyman bookbinder to a Mr. De la Roche, then a French emigrant in London. His master was a very passionate man, and troubled his assistant much; so much, that he felt he could not remain in that place, though every inducement was held out to him. His master liked him; and, to tempt him to stay, said, "I have no child, and if you will stay with me you shall have all I have when I am gone."

In his first letter to his friend Abbott, after his apprenticeship was ended, October 11, he says, "As for the change which you suppose to have taken place with respect to my situation and affairs, I have to thank my late master, it is but little. Of liberty and of time I have, if possible, less than before, though I hope my circumspection has not at the same time decreased. I am well aware of the irreparable evils that an abuse of those blessings will give rise to. These were pointed out to me by common sense; nor do I see how anyone who considers his own station and his own free occupations, pleasures, actions, &c., can unwittingly engage himself in them. I thank that Cause to whom thanks are due that I am not in general a profuse waster of those blessings which are bestowed on me as a human being; I mean health, sensation, time, and temporal resources. Understand me here, for I wish not to be mistaken: I am well aware of my own nature; it is evil, and I feel its influence strongly. I know, too, that ——; but I find that I am passing insensibly to a point of divinity; and as these matters are not to be treated lightly, I will refrain from pursuing it."

To his friend Huxtable he writes on the 18th: "Conceiving it would be better to delay my answer until my time was expired, I did so; that took place Oct. 7, and since then I have had by far less time and liberty than before. With respect to a certain place I was disappointed, and am now working at my old trade, the which I wish to leave at the

first convenient opportunity. I am at present in very low spirits, and scarce know how to continue on in a strain that will be any way agreeable to you."

"Under the encouragement of Mr. Dance," he says, "I wrote to Sir Humphry Davy, sending, as a proof of my earnestness, the notes I had taken of his last four lectures: the reply was immediate, kind, and favourable. After this I continued to work as a bookbinder, with the exception of some days, during which I was writing as an amanuensis for Sir H. Davy, at the time when the latter was wounded in the eye from an explosion of the chloride of nitrogen."

On the 24th of December, 1812, Sir Humphry Davy wrote to Faraday:—"Sir, I am far from displeased with the proof you have given me of your confidence, and which displays great zeal, power of memory, and attention. I am obliged to go out of town, and shall not be settled in town till the end of January; I will then see you at any time you wish. It would gratify me to be of any service to you. I wish it may be in my power. I am, Sir, Your obedient humble Servant."

Æt. 21 (1813).

He "went," he says, "to the City Philosophical Society, which was founded in 1808 at Mr. Tatum's house, and, I believe by him. He introduced me as a member of the Society in 1813. Magrath was secretary to the Society. It consisted of thirty or forty individuals, perhaps all in the humble or moderate rank of life. Those persons met every Wednesday evening for mutual instruction. Every other Wednesday the members were alone, and considered and discussed such questions as were brought forward by each in turn. On the intervening Wednesday evenings friends also of the members were admitted, and a lecture was delivered, literary or philosophical, each member taking the duty, if possible, in turn (or in default paying a fine of half a guinea). This Society was very moderate in its pretensions, and most valuable to the members in its results." [I remember, too, says one of the members, we had a "class-book," in which, in rotation, we wrote essays, and passed it to each other's houses.]

Sir H. Davy, at his first interview, advised him to keep in business as a bookbinder, and he promised to give him the work of the Institution, as well as his own and that of as many of his friends as he could influence.

One night, in Weymouth-street, he was startled by a loud knock at the door, and on looking out he saw a carriage, from which the footman had alighted and left a note for him. This was a request from Sir H. that he would call on him the next morning. Sir H. then referred to their former interview, and inquired whether he was still in the same mind, telling him that if so he would give him the place of assistant in the laboratory of the Royal Institution, from which he had on the previous day ejected its former occupant. The salary was to be 25s. a week, with two rooms at the top of the house.

In the minutes of the meeting of Managers on the 1st of March, 1813, is this entry:—"Sir Humphry Davy has the honour to inform the Managers that he has found a person who is desirous to occupy the situation in the Institution lately filled by William Payne. His name is Michael Faraday. He is a youth of twenty-two years of age. As far as Sir H. Davy has been able to observe or ascertain, he appears well fitted for the situation. His habits seem good, his disposition active and cheerful, and his manner intelligent. He is willing to engage himself on the same terms as given to Mr. Payne at the time of quitting the Institution.

"Resolved,—That Michael Faraday be engaged to fill the situation lately occupied by Mr. Payne, on the same terms."

As early as the 8th of March, Faraday dates his first letter from the Royal Institution to his friend Abbott.

"I have been employed," he says, "to-day in part in extracting the sugar from a portion of beetroot, and also in making a compound of sulphur and carbon—a combination which has lately occupied in a considerable degree the attention of chemists."

A month later he says:—"When writing to you I seize that opportunity of striving to describe a circumstance or an experiment clearly, so that you will see I am urged on, by selfish motives partly, to our mutual correspondence; but though selfish yet not censurable.

"Agreeable to what I have said above, I shall at this time proceed to acquaint you with the results of some more experiments on the detonating compound of chlorine and azote; and I am happy to say I do it at my ease, for I have escaped (not quite unhurt) from four different and strong explosions of the substance. Of these, the most terrible was when I was holding between my thumb and finger a small tube containing 7½ grains of it. My face was within twelve inches of the tube, but I fortunately had on a glass mask. It exploded by the slight heat of a small piece of cement that touched the glass above half an inch from the substance, and on the outside. The explosion was so rapid as to blow my hand open, tear off a part of one nail, and has made my fingers so sore that I cannot yet use them easily. The pieces of tube were projected with such force as to cut the glass face of the mask I had on."

On the 1st of June he writes:—"The subject upon which I shall dwell more particularly at present has been in my head for a considerable time, and it now bursts forth in all its confusion. The opportunities that I have lately had of attending and obtaining instruction from various lecturers in their performance of the duty attached to that office, has enabled me to observe the various habits, peculiarities, excellencies, and defects of each of them, as they were evident to me during the delivery. I did not wholly let this part of the things occurrent escape my notice; but, when I found myself pleased, endeavoured to ascertain the particular circumstance that had affected me; also, when attending to Mr. Brande and Mr. Powell in their lectures, I observed how the audience were affected, and by what their pleasure and their censure was drawn forth.

"It may, perhaps, appear singular and improper that one who is entirely unfit for such an office himself, and who does not even pretend to any of the requisites for it, should take upon him to censure and commend others, to express satisfaction at this, to be displeased with that, according as he is led by his judgment, when he allows that his judgment is unfit for it; but I do not see, on consideration, that the impropriety is so great. If I am unfit for it, it is evident that I have yet to learn; and how learn better than by the observation of others? If we never judge at all, we shall never judge right; and it is far better to learn to use our mental powers (though it may take a whole life for the purpose) than to leave them buried in idleness, a mere void." And then for three letters he goes on with his ideas on lecture-rooms, lectures, apparatus, diagrams, experiments, audiences; and when urged, two years later, to complete his remarks, he answers, Dec. 31, 1816:—"With respect to my remarks on lectures, I perceive I am but a mere tyro in the art, and therefore you must be satisfied with what you have, or expect at some future time a recapitulation, or rather revision of them."

"During this spring Magrath and I established the mutual-improvement plan, and met at my rooms up in the attics of the Royal Institution, or at Wood-street at his warehouse. It consisted perhaps of half a dozen persons, chiefly from the City Philosophical Society, who met of an evening to read together, and to criticise, correct, and improve each other's pronunciation and construction of language. The discipline was very sturdy, the remarks plain and open, and the results most valuable. This continued for several years." Saturday night was the time of meeting at the Royal Institution, in the furthest and uppermost room in the house, then Faraday's place of residence.

He says:—"In the autumn, Sir H. Davy proposed going abroad, and offered me the opportunity of going with him as his amanuensis, and the promise of resuming my situation in the Institution upon my return to England. Whereupon I accepted the offer, left the Institution on the 13th of October, and, after being with Sir H. Davy in France, Italy, Switzerland, the Tyrol, Geneva, etc., in that and the following year, returned to England and London the 23rd of April, 1815."

Whilst abroad he kept a daily journal, "not," he said, "to instruct or to inform, or to convey even an imperfect idea of what it speaks; its sole use is to recall to my mind at some future time the things I see now, and the most effectual way to do that will be, I conceive, to write down, be they good or bad, my present impressions." From this journal, and from his letters to his mother, and

his friend Benjamin Abbott, only a few characteristic passages can be given here.

In his journal he wrote, Wednesday, 13th of October:—

This morning formed a new epoch in my life. I have never before, within my recollection, left London [he had as an infant gone to Newcastle and Whitehaven, by sea chiefly] at a greater distance than twelve miles, and now I leave it, perhaps, for many years, to visit spots between which and home whole realms will intervene. 'Tis, indeed, a strange venture at this time to trust ourselves in a foreign and hostile country, where also so little regard is had to protestations and honour, that the slightest suspicion would be sufficient to separate us for ever from England, and perhaps from life. But curiosity has frequently incurred dangers as great as these, and therefore why should I wonder at it in the present instance. If we return safe, the pleasures of recollection will be highly enhanced by the dangers encountered; and a never-failing consolation is that, whatever be the fate of our party, variety, a great source of amusement and pleasure must occur."

Some idea of the variety of his observations may be got from this note: "28th October, Dreux,—I cannot help dashing a note of admiration to one thing found in this part of the country—the pigs! At first I was positively doubtful of their nature; for though they have pointed noses, long ears, rope-like tails, and cloven feet, yet who would have imagined that an animal with a long thin body, back and belly arched upwards, lank sides, long slender feet, and capable of outrunning our horses for a mile or two together, could be allied to the fat sow of England! When I first saw one, which was at Morlaix, it started so suddenly, and became so active in its motions on being disturbed, and so dissimilar in its action to our swine, that I looked out for a second creature of the same kind before I ventured to decide on its being a regular or an extraordinary production of nature; but I find they are all alike, and that what at a distance I should judge to be a greyhound, I am obliged on a near approach, to acknowledge a pig."

Æt. 22 (1814).

To his mother he writes, April 14, 1814, from Rome:—"When Sir H. Davy first had the goodness to ask me whether I would go with him, I mentally said, 'no, I have a mother, I have relations here,' and I almost wished that I had been insulated and alone in London; but now I am glad that I have left some behind me on whom I can think, and whose actions and occupations I can picture in my mind. Whenever a vacant hour occurs I employ it by thinking on those at home. In short, when sick, when cold, when tired, the thoughts of those at home are a calm and refreshing balm to my heart. Let those who think such thoughts are useless, vain, and paltry, think so still. I envy them not their more refined and more estranged feelings. Let them look about the world unencumbered by such ties and heart-strings, and let them laugh at those who, guided more by nature, cherish such feelings. For me, I still cherish them, in opposition to the dictates of modern refinement, as the first and greatest sweetness in the life of man."

In a letter to his friend Abbott, dated September 6, 1814, he says:—"I fancy that when I set my foot in England I shall never take it out again; but I find the prospect so different from what it appeared to be that I am certain if I could have foreseen the things that have passed, I should never have left London. In the second place, enticing as travelling is (and I appreciate fully its advantages and pleasures), I have several times been more than half decided to return hastily home; but second thoughts have still induced me to try what the future may produce, and now I am only detained by the wish of improvement. I have learned just enough to perceive my ignorance, and, ashamed of my defects in everything, I wish to seize the opportunity of remedying them. The little knowledge I have gained in languages makes we wish to know more of them, and the little I have seen of men and manners is just enough to make me desirous of seeing more; added to which, the glorious opportunity I enjoy of improving in the knowledge of chemistry and the sciences continually, determines me to finish this voyage with Sir Humphry Davy; but if I wish to enjoy those advantages I have to sacrifice much; and though those sacrifices are such as an humble man would not feel, yet I cannot quietly make them. Travelling, too, I find, is almost inconsistent with religion (I mean modern travelling), and I am yet so old-fashioned as to remember strongly (I hope perfectly) my youthful education, and upon the whole, *malgré* the advantages of travelling, it is not impossible but that you may see me at your door when you expect a letter."

Æt. 23 (1815).

On the 25th January, 1815, he writes:—"You tell me I am not happy, and you wish to share my difficulties. I have nothing important to tell you, or you should have known it long ago; but, since your friendship makes you feel for me, I will trouble you with my trifling affairs.

"It happened, a few days before we left England, that Sir H.'s valet declined going with him, and in the short space of time allowed by circumstances, another could not be got. Sir H. told me he was very sorry, but that if I would do such things as were absolutely necessary for him until he got to Paris, he should there get another. I murmured, but agreed. At Paris he could not get one; at Lyons he could not get one; at Montpelier he could not get one; nor at Genor, nor at Florence, nor at Rome, nor in all Italy; and I believe at last he did not wish to get one; and we are just the same now as we were when we left England. This, of course, throws things into my duty which it was not my agreement, and is not my wish, to perform, but which are, if I remain with Sir H., unavoidable. These, it is true, are very few; for having been accustomed in early years to do for himself, he continues to do so at present, and he leaves very little for a valet to perform; and as he knows that it is not pleasing to me, and that I do not consider myself as obliged to do it, he is always as careful as possible to keep the things from me which he knows would be disagreeable. But Lady Davy is of another humour. She likes to show her authority, and at first I found her extremely earnest in mortifying me. This occasioned quarrels between us, at each of which I gained ground and she lost it; for the frequency made me care nothing about them, and weakened her authority, and after each she behaved in a milder manner. Sir H. has also taken care to get servants of the country, yeleped *lacquais de place*, to do everything she can want, and now I am somewhat comfortable; indeed at this moment I am perfectly at liberty, for Sir H. has gone to Naples to search for a house or lodging to which we may follow him, and I have nothing to do but see Rome, write my journal, and learn Italian."

About the same time he writes to his friend Hnxtable:—"Since Sir H. has left England he has made a great addition to chemistry in his researches on the nature of iodine. He first showed that it was a simple body. He combined it with chlorine and hydrogen, and lately with oxygen, and thus has added three acids of a new species to the science. He combined it with the metals, and found a class of salts analogous to the hyperoxymuriates. He still further combined these substances, and investigated their curious and singular properties.

"The combination of iodine with oxygen is a late discovery, and the paper has not yet perhaps reached the Royal Society. It confirms all Sir H.'s former opinions and statements, and shows the inaccuracy of the labours of the French chemists on the same subjects.

"Sir Humphry also sent a long paper lately to the Royal Society, on the ancient Greek and Roman colours, which will be worth your reading when it is printed."

A fortnight after his return to England he was engaged as assistant in the laboratory at a salary of 30s. a week, and apartments were given to him.

(To be continued.)

On the 21st ult. the seventh meeting of the Liverpool Chemists' Association was held, when a paper was read by Charles Symes, Ph.D., on "Practical Pharmacy." The author of the paper made some practical remarks on the business of the chemist, and in the course of his observations he urged that chemists should sell homœ p hatic as well as allopathic medicines.

A young man, named Backer, has been committed to prison at Sheffield, for having attempted to poison his father, mother, brother, and three sisters, by putting the contents of a threepenny packet of Battle's vermin destroyer into a saucepan containing broth for dinner.

Corner for Students.

CONDUCTED BY J. C. BROUGH, F.C.S.

The chemical notation employed in this section is based upon the new system of atomic weights, unless the use of the older system is specially indicated. In the *British Pharmacopœia* the symbolic formulæ corresponding to those adopted here are printed in heavy Clarendon type. The chemical nomenclature generally used in this Corner for Students agrees with that adopted in the new edition of *Fownes's Manual of Chemistry* which is recommended as a text-book. To secure uniform results students are requested to accept the atomic weights given in the last column of the *Pharmacopœia* table of elementary bodies.

QUESTIONS.

I. FERRI IODIDUM, *B.P.*—Explain, with the aid of symbolic formulæ, the "characters and tests" noticed in the Pharmacopœia, in connection with this salt.

II. SODÆ ARSENIAS, *B.P.*—Calculate from the symbolic formula the percentage of arsenic in this salt.

III. INDIRECT ANALYSIS.—A mixture of sodium and potassium chlorides, weighing 86·2 grains, yields 42·6 grains of chlorine. What is the weight of the sodium chloride in the mixture?

IV. AMMONIA.—Gaseous ammonia, by passage through a red-hot tube, undergoes a chemical change, attended by a dilatation of the gas to twice the original volume. If the altered gas be mixed with half its volume of oxygen and exploded, the volume of the resulting gaseous product will be three-fourths of that of the ammonia. Explain these changes in composition and volume by symbolic equations.

V. SULPHURETTED HYDROGEN.—Pure hydrogen monosulphide, or sulphuretted hydrogen, is usually obtained by the action of hydrochloric acid on antimony trisulphide. What weight of the last-named substance, in *grammes*, would be needed for the production of 20 litres of the gas at 13·6° C. and 754 mm. barometric pressure.

VI. FERRIC OXIDE.—If hydrogen gas, in excess, were passed over 35·783 grains of pure ferric oxide at a red heat, what would be the weight of the water produced?

VII. ACTION OF ACIDS ON COPPER.—Copper is attacked by nitric acid, and also by heated sulphuric acid. In each case the solution of the metal is attended with the evolution of gas. Represent the reactions symbolically.

VIII. ARSENETTED HYDROGEN.—What is the substance precipitated when arsenetted hydrogen is passed into a solution of silver nitrate? Explain its production by means of a symbolic equation.

IX. SPECIFIC GRAVITY.—A flask holds exactly 1087 grains of benzol when filled to the brim. After introducing 100 grains of a solid substance, and carefully wiping the outside of the flask, the weight of the benzol and the solid together is found to be 1,100 grains. The sp. gr. of the benzol being ·850, what is the sp. gr. of the solid substance?

X. COMBUSTION OF CARBON.—A chamber contains 50 cubic metres of air at 13° C. and 760 mm. pressure. 400 *grammes* of carbon are completely burnt in the room and nothing allowed to escape. What is the percentage composition, by volume, of the mixture of gases now filling the room, assuming that the air originally consisted of 21 per cent. oxygen and 79 per cent. nitrogen, by volume?

ANSWERS.

[*See Questions in January number, page* 27.]

I. HYDRARGYRI IODIDUM VIRIDE, *B.P.*—The yellow sublimate which mercurous iodide yields, under the influence of heat, is *mercuric iodide*, HgI_2. This compound is dimorphous, exhibiting a red colour in one of its forms, and a yellow colour in the other.

[The dimorphism of mercuric iodide may be illustrated by a simple experiment. The red iodide mixed with a little water is applied to one side of a card and allowed to dry. On exposing the uncoloured side of the card to the heat of a flame, the coating of iodide suddenly turns yellow. The altered iodide is crystalline, and it retains its yellow colour when cooled; but if the minute crystals of which it is composed be broken, by rubbing, the bright vermilion colour of the iodide is restored.]

II. FERRI ET QUINIÆ CITRAS, *B.P.*—The question given under this head last month was defective, and consequently ambiguous. The question we intended to propose may be thus stated: What is the weight of alkaloid in 100 grains of this preparation, and how many grains of Quiniæ Sulphas, *B.P.*, are required to yield the same weight of alkaloid?

According to the quantitative test, 100 grains of Ferri et Quiniæ Citras correspond to 16 grains of the alkaloid; and according to the formula given for Quiniæ Sulphas 872 parts of this salt correspond to 648 parts of quinine. Then by the proportion

$$648 : 16 = 872 : x$$

we find $x = 21{\cdot}531$, the number of grains of crystallised quinine sulphate required to yield the quantity of alkaloid that is contained in 100 grains of the scale preparation.

[In awarding marks for answers received, we take into consideration the ambiguous wording of our question.]

III. COMBUSTION OF PHOSPHORUS.—The weights of the two products are 2·29 and 6·726 *grammes*, respectively.

When burned in air 62 *grammes* of phosphorus produce 142 *grammes* of phosphorus pentoxide ($P_2O_5 = 142$), consequently the weight of the product obtainable with 1 *gramme* is found by the proportion:

$$62 : 1 = 142 : x; \therefore x = 2{\cdot}29 \text{ grammes.}$$

Again, when burned in chlorine, 31 *grammes* of phosphorus produce 208·5 *grammes* of phosphorus pentachloride ($PCl_5 = 208{\cdot}5$), so that we get the proportion:

$$31 : 1 = 208{\cdot}5 : x; \therefore x = 6{\cdot}726 \text{ grammes.}$$

IV. HYDROGEN.—The required volume is 57·962 cubic inches.

As 98 *grammes* of sulphuric acid ($H_2SO_4 = 98$) yield two standard volumes, or 22·38 litres, of hydrogen at 0° C., and as 22·38 litres = 1365·8 cubic inches, 60 grains (= 3·888 *grammes*) of the acid will yield 54·186 cubic inches of hydrogen at the same temperature, for

grms.	grms.	cub. in.	cub. in.
98	: 3·888 =	1365·8	: 54·186.

The corresponding volume at 68° Fahr. (= 20° C.) is found by the proportion:

$$273 : 273 + 20 = 54{\cdot}186 : x; \therefore x = 58{\cdot}156 \text{ cub. in.}$$

at 68° Fahr. and normal pressure.

The correction for the difference between the normal pressure of 29·9 inches and the required pressure of 30 inches, is thus calculated:

$$30 : 29{\cdot}9 = 58{\cdot}156 : x; \therefore x = 57{\cdot}962 \text{ cub. in.}$$

at 68° Fahr. and 30 inches pressure.

V. CARBON MONOXIDE.—The volume of carbon monoxide at 56·6° C. obtainable from 20 litres of the dioxide measured at 14·5° C., by the action of red-hot charcoal, is 45·857 litres.

From the equation

$$CO_2 + C = 2CO$$

we learn that the volume of the monoxide produced is twice as great as the volume of dioxide decomposed, supposing both gases to be measured at the same temperature. The problem, therefore, involves merely the determination of the volume at 56·6° which corresponds to 40 litres at 14·5° C.

$$273 + 14{\cdot}5 : 273 + 56{\cdot}6 = 40 : x; \therefore x = 45{\cdot}857 \text{ litres}$$

at 56·6° C.

VI. NITROUS OXIDE (NITROGEN MONOXIDE).—The weight of ammonium nitrate required for the production of one gallon of this gas at 50° Fahr., and 28·6 in. pressure, is 231·248 grains.

The decomposition of ammonium nitrate by heat is represented by the equation

$$NH_4NO_3 = 2H_2O + N_2O;$$

from which it appears that 80 *grammes* of the salt are required to yield 22·38 litres of the gas at 0° C. and at the standard pressure of 29·9 in. The corresponding volume at 10° C. (= 50° Fahr.) and at the same pressure is 23·2 litres, for

$$273 : 273 + 10 = 22{\cdot}38 : 23{\cdot}2.$$

Corrected for the pressure of 28·6 in. the volume is 24·254 litres, for

$$28{\cdot}6 : 29{\cdot}9 = 23{\cdot}2 : 24{\cdot}254.$$

Now as 80 *grammes* of the salt furnish 24·254 litres of the gas at the temperature and pressure indicated, the weight required to yield one gallon (= 4·543 litres) is 14·985 *grammes*, for

$$24{\cdot}254 : 4{\cdot}543 = 80 : 14{\cdot}985.$$

Then taking 15·432 grains in the equivalent of 1 *gramme*, we have

$$14{\cdot}985 \times 15{\cdot}432 = 231{\cdot}248 \text{ grains,}$$

the weight required.

VII. Marsh Gas.—The volumes of marsh gas and oxygen taken are in the proportion of 1 molecule of the former to 4 atoms of the latter, and the reaction attending the explosion may be thus expressed:

$$CH_4 + O_4 = CO_2 + 2H_2O.$$

The carbon dioxide formed has the same volume as the marsh gas (100 measures), and under ordinary circumstances it is the only gaseous product. But supposing the eudiometer to be exposed to a uniform temperature above 100° C., the water produced would be measurable as a gas (steam). From 100 measures of marsh gas and 200 measures of oxygen, we should thus obtain 100 measures of carbon dioxide and 200 measures of water vapour.

VIII. Effects of a Balloon Ascent.—The volume of mercury that will enter the vessel under the conditions stated is 279·672 cub. centimetres.

When the stopcock is closed after the escape of air, the vessel will contain 1000 c. c. of air at 7° C. and 495 mm. pressure. At 22° C., but at the same pressure, the air would measure 1053·571 c. c., for

$$273 + 7 : 273 + 22 = 1000 : 1053{\cdot}571.$$

But the change of pressure from 495 mm. to 724 mm. would be accompanied by an inversely proportional change of volume, 1053·571 c. c. being reduced to 720·328 c. c., for

$$724 : 495 = 1053{\cdot}571 : 720{\cdot}328.$$

Then as the vessel is capable of containing exactly 1000 c. c., or 1 litre, 1000 − 720·328 = 279·672 c. c., the volume of mercury entering the vessel.

IX. Specific Gravity of Cork.—The required sp. gr. is ·24.

The weight of a volume of water equal to the volume of the iron is 5 oz., this being the difference between the weight of the iron in air and its weight in water. The weight of the cork in air is 6 oz., this being the difference between the weight of the iron alone and that of the iron and cork together. We have, therefore, the requisite data for calculating the sp. gr.

Weight of iron and cork *in air*	42	oz.
" " " *in water*	12	
	—	
Weight of water displaced by the two ...	30	
" " " " iron ...	5	
	—	
" " " " cork ...	25	

Then as equal volumes of cork and water weigh 6 oz. and 25 oz., respectively,

$$6 \div 25 = {\cdot}24,$$ the sp. gr. of the cork.

X. Floating Piece of Cork.—The cork will be immersed to the depth of 4·8 inches.

The volumes of equal weights of different substances are in inverse proportion to their densities, and as the densities of water and cork are as 1 to ·24, the volumes of equal weights of cork and water will be as 20 to 4·8, for

$$1 : {\cdot}24 = 20 : 4{\cdot}8.$$

Then as a body floating in water displaces a volume of the liquid equal in weight to itself, a cork cylinder 20 inches in length will necessarily sink to the depth of 4·8 inches.

PRIZES.

The First Prize for the Solutions of Problems in our January number is awarded to

W. H. Weddell, Austin-street, Stamford,

who obtained the Second Prize two months ago.

The Second Prize is awarded to

J. W. Evans, Bridgend, Glamorganshire,

who carried off a similar Prize last September.

The name of the student who obtained an Extra Prize last month again stands third on the table of marks.

Marks awarded for Prizes.

	I.	II.	III.	IV.	V.	VI.	VII.	VIII.	IX.	X.	E.	Total
Weddell(*1st prize*)	6	5	5	9	7	8	8	8	6	6	5	73
Evans (*2nd prize*)	5	6	6	9	7	8	5	8	6	6	6	72
J. A. Kendall ..	5	5	6	5	7	8	8	8	6	6	6	70
J. Gregory ..	2	6	6	7	6	6	8	8	6	6	5	66
A. E J. ..	6	6	6	8	6	5	4	7	6	9	6	66
T. T. ..	5	6	6	8	6	8	8	8	0	5	5	65
J. Paulin..	5	5	3	9	7	7	4	6	6	6	5	63
A. Fraser ..	6	6	6	8	7	0	4	8	6	6	4	61
Non Nobis ..	6	5	6	8	6	4	4	7	6	6	0	58
J. Tully ..	5	6	6	7	6	7	5	0	6	6	3	57
J. W. ..	5	6	6	7	0	0	4	8	6	6	7	55
Tyro ..	2	5	6	8	6	7	4	0	6	6	4	54
H. Habgood ..	5	5	6	7	7	7	4	0	3	3	4	51
Solus ..	6	0	3	0	6	8	4	7	6	6	3	49
J. W. B. ..	5	5	5	6	6	5	4	0	6	6	0	48
A. J. Pepper ..	6	—	6	0	7	0	4	6	6	6	4	45
Jun. Apprentice.	5	6	6	7	6	0	4	0	0	6	3	43
J. D. D. Thomas.	6	6	6	0	0	—	7	0	6	6	3	40

TO CORRESPONDENTS.

*** All questions forwarded to us for publication in this "Corner for Students" should be accompanied by the answers which the propounders believe to be correct. As a rule, numerical results should be worked out to three decimal places, due allowance being made for large remainders. Communications should reach us at least *ten days* before the date of publication, and include the names and addresses of the writers.

Correction.—We could not devote sufficient attention to the revision of our January "Corner," and consequently a few errors of the press escaped our observation. The only misprint which we need notice specially occurs in our Data at the end of the paragraph on standards of temperature and pressure, "20·9 inches" being given instead of "29·9 inches" as the equivalent of 760 mm. As the erroneous number appears in many of the solutions we have received this month, we trust that each student will make the necessary correction in ink to prevent future mistakes. As we are acknowledging our faults, we may admit that the Second and Fifth of our January questions were ambiguously worded, and that we have had to consider this fact in awarding marks.

Calculations relating to Pressure.—Some of our correspondents have unnecessarily expended much labour in converting inches into millimetres, before calculating the changes of volume resulting from changes of atmospheric pressure.

J. Paulin.—III. The second product is phosphorus pentachloride, not the trichloride. To obtain the latter, phosphorus must be gently heated in a current of chlorine, the phosphorus being in excess. VII. With some other able correspondents you have missed the main point of the problem.

J. A. Kendall.—IV. The equivalent of 68 degrees Fahr. is 20 degrees C., not 30 degrees.

Tyro.—VIII. The change of volume attending the change of temperature, is in the proportion of 280 to 295.

J. W. B.—VII. Volume of water vapour miscalculated. VIII. The volume of air in the litre vessel is necessarily 1 litre. Pray cultivate neatness, and try to write a little plainer.

J. D. D. Thomas.—VI. Solution received incomplete.

J. W.—We have given you 4 extra marks this month to correct our error.

Books offered as First Prizes.

Attfield's *Introduction to Pharmaceutical Chemistry.* (Van Voorst.)
Conington's *Handbook of Chemical Analysis;* with Tables of Qualitative Analysis adapted to the same. (Longmans.)
Elliot and Storer's *Manual of Inorganic Chemistry.* (Van Voorst.)
Fownes's *Manual of Elementary Chemistry, Theoretical and Practical* (Churchill.)
Ganot and Atkinson's *Elementary Treatise on Physics.* (Longmans.)
Garrod's *Materia Medica;* with Modern Chemical Notation. (Waiton.)
Noad's *Chemical Analysis, Qualitative* and *Quantitative.* (Reeve.)
Northcote and Church's *Qualitative Analysis.* (Van Voorst.)
Royle and Headland's *Materia Medica.* (Churchill.)
Williamson's *Chemistry for Students.* (Clarendon Press)

[Any other scientific book that is published at a price not greatly exceeding half-a-guinea may be taken as a first prize.]

Books offered as Second Prizes.

Church's *Laboratory Guide for Students in Agricultural Chemistry.* (Van Voorst.)
Galloway's *First Step in Chemistry.* (Churchill.)
Hofmann's *Introduction to Modern Chemistry.* (Walton.)
Oliver's *Lessons in Elementary Botany.* (Macmillan.)
Potts's *Elements of Euclid.* School Edition. (Longmans.)
Roscoe's *Lessons in Elementary Chemistry.* (Macmillan.)
Wurtz's *Introduction to Chemical Philosophy.* Reprinted from the "Chemical News."

[Any other scientific book which is sold for about five shillings may be taken as a second prize.]

REVIEWS.

CHEMICAL LABELS.

Mawson and Swan's *Book of Chemical Labels.* Price One Shilling. Entered at Stationers' Hall. Newcastle-on-Tyne.

The production of a set of chemical labels intended for use in the laboratory is a serious undertaking, for inconsistent

names and erroneous formulæ are intolerable when they come within the sphere of daily observation. Good labels will save the practical chemist an immense amount of trouble, and will gradually impress upon the mind of the student the exact formulæ of the reagents with which he works. On the other hand, labels involving errors are apt to mislead the most wary investigator, and will certainly retard the progress of the student who is exposed to their influence.

We regret that we cannot conscientiously commend Messrs. Mawson and Swan's new book of labels, as the publishers are well-known manufacturers of laboratory requisites, and the columns of this journal have repeatedly been enriched by scientific papers emanating from their establishment. The book consists of 126 separate labels gummed ready for use, prefaced by a table of symbols and atomic weights, and protected by a neat cloth cover. If consistency and correctness were not essential characters of a good set of labels, we might congratulate Messrs. Mawson and Swan on the result of their attempt to supply a common want, but as reagents incorrectly labelled may be likened to thermometers or hydrometers which have been imperfectly graduated, we conclude that a critical notice which may have the effect of limiting the circulation of the Book of Labels will be beneficial to the publishers. The nomenclature adopted by the author of this new set of labels is based upon the nomenclature which has been discarded by most modern chemists; but it involves many peculiarities which the chemists of the old school are not likely to regard with favour. Thus the compound formerly called "Carbonate of Potash," and now generally known as "Potassium Carbonate," is named "Potash Carbonate" by the label-writer. The names intended for general use are printed in bold thick capital letters, and the formulæ and synonyms in ordinary italics. As a rule, two formulæ are given on a label, with the object of indicating the differences between the old and new systems of notation, but in certain cases only one system has been taken into consideration. In some of the labels modern systematic names are prefixed to the corresponding formulæ, but in others the new names are wanting. These inconsistencies indicate the slip-shod workmanship which characterises the whole series of labels.

The names "Acid Arsenic," "Acid Arsenious," "Acid Boracic," "Acid Chromic," and "Acid Sulphurous," are associated with formulæ of anhydrous oxides, compounds which are not regarded as true acids by the majority of modern chemists, but in other cases the generic term Acid is applied to hydrogen salts in accordance with modern usage. Thus while the formula SO_2 is printed under the name "Acid Sulphurous," the formulæ HO,SO_3 (old) and H_2SO_4 (new) are connected with the name "Acid Sulphuric." We admit that the anhydrous oxides referred to are commonly called acids, but as modern names are included in many of the labels, we contend that they ought not to have been omitted in the labels of these false acids. The formulæ connected with the name "Acid Boracic" indicate the anhydrous boric oxide, and not the crystallised acid, which is usually kept in the laboratory; moreover, in the old formula the symbol of boron is misprinted Bo. The single formula which does duty for the old and new formulæ of "Acid Formic," is neither the one nor the other. The formula given under "Acid Hydrofluosilicic" has disappeared from chemical treatises, not because it is inconsistent with the new notation, but because it does not accord with analytical results. To "Acid Nitric" two labels are allotted, the one for a solution of sp. gr. 1·42 (the nitric acid of the Pharmacopœia), and the other for acid of sp. gr. 1·500, which is said to contain 93 per cent. of HNO_3. Now the strong nitric acid employed in the laboratory is usually considered to be the actual acid HNO_3, the sp. gr. of which is about 1·52, and the intimation that it invariably contains 7 per cent. of water is obviously superfluous, especially as the labels given for "Acid Sulphuric" include no reference to the small percentage of water which is almost always associated with H_2SO_4. The old and new formulæ given under "Acid Citric" are discordant, water of crystallisation being indicated in the latter, but not in the former. The full point which is now generally used to divide the essential symbols of a compound from those which refer to the water of crystallisation is omitted in these labels, and many of the modern formulæ appear abnormally complex in consequence of this omission. The transposition of the two parts of the name of each acid is an instance of the unsystematic way in which these labels have been produced. If any advantage result from labelling Sulphuric Acid "Acid Sulphuric," a corresponding transposition should have been effected in such names as "Copper Oxide," "Calcium Chloride," and "Zinc Sulphate."

In retaining the names "Alumina," "Baryta," "Lime," "Potash," "Soda," and "Strontia," in the nomenclature of the oxygen-salts, the author of the Book of Labels shows himself to be a staunch conservative. The names "Baryta Sulphate" and "Copper Sulphate" are not analogous. For the sake of consistency, the former ought to be altered to "Barium Sulphate," or else the latter ought to be expanded to "Black-copper-oxide Sulphate." We can excuse the author's attempt to prolong the life of old names, but we must protest against his introduction of the name "Ammonia Chloride." The compound to which it is applied may be called Ammonium Chloride or Ammonia Hydrochlorate, but we cannot square any formula with this new irregular name. The formula given under "Ammonia Molybdate" and "Strontia Nitrate" are incorrect. The modern name for "Manganese Oxide" (the black oxide) is given as "Manganic Oxide," which is the name usually applied to the sesquioxide.

The labels for potassium and sodium hydrates do not correspond. The term "sulphide" is properly employed in several labels, but iron sulphide is labelled "Iron Sulphuret." Other inconsistencies and errors might be pointed out, but we have said quite enough to prove that Messrs. Mawson and Swan's Book of Chemical Labels cannot be safely introduced into a laboratory.

OUR LIBRARY TABLE.

The "Modified Examination" of the Pharmaceutical Society. A Guide to the principal points in Prescriptions, Dispensing, Materia Medica, and Pharmacy. By F. Harwood Lescher. Second Edition. John Churchill and Sons.

This work is a tabular synopsis of the four subjects embraced by the Modified Examination of the Pharmaceutical Society. As an aid to memory and an index to the chief points of the subjects referred to, we can recommend this compilation. The Pereira Medallist has evidently expended much labour on the work, and appears to have scrupulously followed the standard text-books.

Pharmacopœia of the Royal Hospital for Diseases of the Chest. John Churchill and Sons.

A handy little book, of twenty-six pages, containing nearly a hundred formulæ for preparations used in the Hospital named, including one for Emulsio Pancreatica; also the Diet-scale of the institution.

Pharmacopoeæ recentiores, Anglica, Gallica, Germaniæ, Helvetica, Russicæ, inter se collatæ. Scripsit, præfatus est et indicem triplicem adjecit H. Hager. Ph.D. London: Trübner and Co.

A conspectus of the five principal Pharmacopœias of Europe by Dr. Hermann Hager, the well-known pharmacologist, written throughout in Latin, is a work that needs no special commendation, as it is obviously a most important addition to the pharmacist's library of reference.

The Law to Regulate the Sale of Poisons within Great Britain. By William Flux, Attorney-at-Law, Solicitor to the Pharmaceutical Society, etc. Churchill and Sons.

Mr. Flux, by arranging the leading passages of the statutes regulating the sale of poisons in a manner to facilitate reference and comparison, has produced a book of public utility. Wherever convenient Mr. Flux has given the precise words of the statutes in preference to words or opinions of his own.

Books and Periodicals Received.—In addition to the works noticed above, we have received

Town Life among the Poorest. By John Edward Morgan, M.A., M.D., Oxon. Longmans.

Lectures on the Preservation of Health. By Charles A. Cameron, Ph.D., M.D. Cassell, Petter, and Galpin.

Our Discharged Convicts. From the Discharged Prisoners' Association.

"The Pharmaceutical Journal;" "The British Medical Journal;" "The Monthly Homœopathic Review;" "Bulletin de la Société de Pharmacie" (Bordeaux); "Scientific American;" "New York Druggists' Circular" "American Journal of Materia Medica" (Tilden, New York); "Medical and Surgical Reporter" (Philadelphia); "Canada Pharmaceutical Journal;" "Pacific Medical Journal;" "Trade Review" (Montreal); "Stationer;" "Grocer;" "Produce Markets' Review;" "Mather's Price Current;" "Journal of Society of Arts;" "European Mail."

THE MONTH

BRITISH PHARMACEUTICAL CONFERENCE.

PROPOSAL TO INVITE THE MEMBERS TO VISIT TORQUAY.

A meeting of the chemists of Torquay took place on Thursday evening the 4th inst., at the Victoria Club, consider a proposal to invite the members of the British to Pharmaceutical Conference, visiting Exeter in August next, in conjunction with the British Association, to pay a visit to Torquay; and to decide upon the means to carry out the project in a manner becoming the dignity of the pharmaceutical profession in Torquay.

Mr. W. Hearder was unanimously voted to the chair, and succinctly explained the objects of the meeting.

Messrs. Guyer, Smith, Narracott, and Millar, having addressed the meeting, and expressed their warm approval of its object, the following resolution was carried:—"That this meeting considers it desirable that an invitation be sent to the Executive Committee of the Pharmaceutical Conference, and members from a distance, to visit Torquay during the meeting of the Conference at Exeter in August next."

It was also proposed and resolved,—"That the chemists of Paignton and St. Mary-Church be invited to unite with those of Torquay in carrying out the objects of this meeting."

The following gentlemen were chosen as a Committee, with power to add to their number:—Mr. W. Hearder, Treasurer; Mr. D. Watson, Secretary; Mr. Guyer, Mr. Smith, Mr. Glanfield, Mr. Millar, Mr. Narracott.

A subscription list having been opened and liberally responded to, the Chairman expressed the pleasure it had afforded him to preside over a meeting characterised by such a mutual feeling of goodwill, and he trusted that the same friendly feeling would always animate them in their intercourse with each other.

The meeting then separated.

GLASGOW CHEMISTS' AND DRUGGISTS' ASSOCIATION.

The annual festival of this association took place in the Choral Hall, on Thursday evening, 14th of January. Mr. Thomas D. Moffat presided, and was accompanied to the platform by Messrs. Kinninmont, Hatrick, Rait, Black, McMillan, Davison, and others, of Glasgow; Mr. Duncanson, of Stirling; Mr. Kemp, of Edinburgh; Mr. Ferguson, of Greenock; Drs. Carter Moffat, Robertson, Tannahill, Wood Smith, Hislop, J. G. Wilson, etc There were upwards of 400 ladies and gentlemen present. After tea the Chairman rose and was received with cheers. He said, "Ladies and Gentlemen—We meet to-night under altered circumstances from our former meetings. By the passing of the Pharmacy Act, we find ourselves elevated from the position of tradesmen to that of a profession—every one after this obliged to give evidence of his attainments and skill, before being permitted to open a dispensary. And, I believe, when all the little points on which there is at present some difference of opinion have shaken themselves right, the Act will be found to be for the benefit of ourselves and the general public. But though this is the first Act which affects and restricts the pharmacists of the whole of Great Britain, it is by no means the first that has been passed for our benefit in the west of Scotland. For, on the 30th November, 1599, nearly 300 years ago, James the Sixth gave a charter (which was afterwards confirmed by Parliament) to a physician, a surgeon, and an apothecary:—

"Maister Peter Low, Maister Robert Hamiltone, and Maister William Spang, and thair successouris, indwelleris of our citie of Glasgow, *GEVAND* and *GRANTAND* to thame and thair successouris, full power to call, sumonnd and convene before thame, within the said burgh of Glasgow, or onie otheris of ouir said burrowis or publict places of the foresaid boundis, all personis professing or using the said airt of chirurgie, to examine thame upon thair literature, knawledge, and practize; gif they be fund wordie, to admit, allow, and approve thame, give thame testimonial according to thair airt and knawledge, that they sal be fund wordie to exercise thareftir, resave thair aithes, and authorize thame as accordis, and to discharge thame to use onie farder nor they have knawledge passing thair capacity, laist our subjects be abusit."

The likeness of this charter to the present Pharmacy Act is astonishing; it shows how history repeats itself in pharmaceutical as well as other affairs, and I will quote two clauses to show the resemblance. The Pharmacy Act, 1868, says: "That any person who shall use, or exhibit the name or title of chemist and druggist, not being a duly registered pharmaceutical chemist, or chemist and druggist, shall, for every such offence, pay a penalty or sum of five pounds." The old Act says: "*Fythlie*, That na manir of personis sell onie droggis within the Citie of Glasgow, except the sam be sichtit be the saidis visitouris, and be William Spang, apothecar, under the pain of confiscatioune of the droggis." Again, the Act of 1868 says: "And on every sale of any such article (poison) the seller shall, before delivery, make, or cause to be made, an entry in a book to be kept for that purpose, stating the date of the sale, the name and address of the purchaser, the name and quantity of the article sold, and the purpose for which it is stated by the purchaser to be required, to which entry the signature of the purchaser, and of the person, if any, who introduced him, shall be affixed." The old Act ordered "*Sextlie*, That nane sell ratoun poison asenick or sublemate, under the pane of ane hundred merkis, excep onlie the apothecaries, quha sal be bund to tak cautioun of the byaris, for coist, skaith and damage." Under this charter, the Faculty of Physicians and Surgeons of Glasgow continued to examine and grant licences to surgeons and apothecaries. At first the practice of pharmacy and surgery were generally combined, and the first date of the licensing of an apothecary distinct from surgeon is in 1614, when "Gabriel Syeserf, pothecar, is admittit freman and brother of craft, and he to use his ain calling." In these times of the major and minor examinations of the pharmaceutical society, when so many of the sciences are included in pharmacy, we are perhaps rather apt to underrate the examination of those days; but there is evidence of its having been very strict, and though, perhaps, not so theoretical as it is now-a-days, it certainly seems to have been very practical. On the 19th of June, 1658, David Spiers petitioned to be allowed to practise pharmacy, and was ordered to make "consectio hamech, pilulæ cochir majores, emplastrum de mucilaginibus, linimentum mici, trochei albi rasis," when he passed his pharmaceutical examination satisfactorily. In those days the compounds were very complex. In an old pharmacopœia I lately counted forty-five different

ingredients in one ointment. That was in the official prescription, but it seems scarcely possible that in making it the whole of them would be used. For two hundred years the Faculty continued to grant diplomas to practise pharmacy alone, but this has long been discontinued, and the last pharmacist who held one of the old licences was the late Mr. John Niel, of this city. Some time ago, before the present Act was thought of, I made application to be examined and licensed, but owing to the diploma being apt to be represented as a higher one, my application was refused. The reason for refusal I can understand to be an excellent one, and I can appreciate the caution with which all licences must be given, but at the time I considered that the highest honour I could get, would have been an educational certificate and diploma under that good old charter of James the Sixth.

But that old Act, so far as regards pharmacy, is now superseded by this new one, which is so singularly like it in its provisions. Its administration is now in the hands of those whom I believe to be the proper parties—the pharmacists themselves. I believe that the rigid examination will raise the status and usefulness of our profession, and I am glad that the Association under whose auspices this meeting is held, was so quick to establish classes for the necessary practical course of study.

Our gratitude is due to those men in the Pharmaceutical Society, and out of it, who so long strove to gain this important end, and who, having gained it, devote their time and energies to its working. But I doubt not that the complete working of it lies, in a great measure, with ourselves, and I hope that by acting in unison, and looking after our interests, we shall reap in full the benefits which it can confer.

Addresses were afterwards delivered by Mr. Duncanson, who is an old member of the Association, and Mr. Kemp. The entertainment was agreeably varied by singing and music by several eminent *artistés*, and the evening's amusement concluded with a ball, which was a very happy affair, and passed off with great success.

YORK CHEMISTS' ASSOCIATION.

ANNUAL MEETING.

The annual meeting of the York Chemists' Association was held on Friday evening, the 5th February, at the King's Arms Hotel, the President, Mr. George Dennis, in the chair.

The report having been read, and the balance-sheet audited, the usual vote of thanks was accorded to the officials of the society, who were unanimously re-elected, and the annual dinner was appointed to take place on Tuesday, the 23rd inst. Appended is a copy of the report.

FOURTH ANNUAL REPORT.

Your Committee have great pleasure in presenting their fourth Annual Report to the members of the York Chemists' Association, and hope that the success which has hitherto attended their efforts in furthering the friendly feeling of the members of the trade may be long continued.

In the spring and summer your Committee held several meetings, to consider the amended Pharmacy Bill and the Act for the Storage of Petroleum, when it was thought desirable there should be a general meeting of the members, to discuss matters so intimately affecting their interests. Your honorary Secretary accordingly sent a circular to each member, but through some unforeseen cause none but a few of the Committee attended, and a great amount of trouble was caused, to no purpose. The Committee, however, hope the members in future will sustain them in their labours better than in the past.

During the last session of Parliament the amended Pharmacy Bill (so long hoped for) was eventually passed, but it assumed a shape rather different to what was intended by its promoters and by this Society; along with a great deal of good a considerable amount of evil has resulted from hasty and ignorant legislation, a penal bill has been passed, and vexatious regulations introduced that really hamper and annoy the trade, and at the same time inconvenience the public; and some of them are even positively ludicrous Such legislation cannot long stand, as restrictions of the nature indicated must of necessity lead to non-observance and evasion, and to ultimate repeal.

Your Committee consider a great mistake has been made, as an educational bill was all that was required; as after passing an examination any person must have been competent to have conducted a business on his own responsibility, without being tied down by absurd regulations, which only expose the incompetence and ignorance of those who made them.

Your Committee received an invitation from the Secretary of the Pharmaceutical Conference at Norwich to attend the meeting in connection with the British Association, but none of them finding it convenient to attend, your honorary Secretary was obliged to politely decline it, at the same time thanking them for their courtesy, and wishing them success.

Taking into consideration the necessity that has arisen since the passing of the Pharmacy Act that all assistants and apprentices should have an opportunity of qualifying themselves for the examinations of the Pharmaceutical Society, your Committee would recommend that a school or classes should be established in connection with this Association, to facilitate their acquirement of knowledge in chemistry, botany, etc., as required by the Pharmacy Act.

The Storage of Petroleum Bill came into operation on the 1st instant, and needs the immediate attention of the trade, as licenses have to be obtained from the local authority, which in York is the Board of Health Committee.

Your Committee would recommend the Annual Dinner to take place at the King's Arms Hotel, on Tuesday, the 23rd instant, and hope to have a good attendance of members to join in the festivity.

Appended is the usual statement of accounts for the past year, showing a balance in hand of £6 13s. 3d.

RECEIPTS.

To balance in hand and subscriptions, 1868 ...	£16	6	7

EXPENDITURE.

To postages, stationary, meeting, sundries, and annual dinner	£9	13	4
Balance in hand	6	13	3
	£16	6	7

(Signed) GEORGE DENNIS, *Chairman.*
THOMAS COOPER, *Treasurer.*
JOHN BROWN, *Secretary.*

York, February 5th, 1869.

CHEMISTS' ANNUAL BALL.

The chemists' ball held at Willis's Rooms, St. James's, on the evening of Wednesday, the 20th ult., was a delightful *reunion*, and we must congratulate the committee and their energetic honorary secretary, Mr. Watson, on the very successful result of their labours. The arrangements for the evening's entertainment must have satisfied the most fastidious observer, and as the fleeting pleasures of the assembly are connected with a substantial donation to a charitable fund, the success of next year's ball is insured. Nearly 300 tickets were sold, and the committee, after paying all expenses, found that a balance of £23 remained in hand. Of this sum twenty guineas have been presented to what is now the Benevolent Fund of the whole body of chemists and druggists, while the remaining sum of £2 has been added to the £8 in hand last year. The president and treasurer of the Pharmaceutical Society, with many of the members of Council, were present.

At the supper-table, in response to a unanimous call,

Professor ATTFIELD rose and said: Ladies and gentlemen, in supporting our usual and only toast, it is pleasant to know that we do so for the third time now. If our only motive for wishing "Success to the Chemists' Annual Ball" were desired for the repetition of the enjoyment we are experiencing this evening, that alone would be sufficient to justify us in uplifting our glasses and voices to the toast. But when we remember the pleasure we have had here on former occasions, and especially when we look forward not only to one but to many similar gatherings in which we hope to share, we may, indeed, earnestly and heartily join in the toast now before us. There is, however, another reason why on the present occasion we should rejoice in the establishment of a chemists' annual ball. When this very agree-

able entertainment was first started, it was not without the hope on the part of its promoters that it would contribute in some slight degree to that union of chemical and physical forces which would certainly multiply strength, and engage all ranks of our trade and profession. The result is most gratifying. At the first ball not a few generals of the various divisions of the army met and conversed together for the first time; that smoothed the way for subsequent conferences, and the end is that a battle against our common foes, ignorance, distrust, and inertia, has been fought on the floor of the House of Commons, and, by help of our senators, a great victory achieved. Ladies, much of this result is due to you; it is to you we owe the successful establishment of the ball; it is your consent in large numbers to accompany fathers and brothers, and, let us say, cousins, to this annual entertainment that alone makes its continuance possible; may we ask you to renew your efforts to induce still larger numbers of lady friends to be here next year. Ladies and gentlemen, now let us all, with three times three, drink "Success to the chemists' annual ball."

DUNDEE CHEMISTS' AND DRUGGISTS' ASSOCIATION.

The usual monthly meeting of the Dundee Chemists' and Druggists' Association was held in Lamb's Hotel, on Wednesday evening, the 3rd inst., Mr. William Laird, Vice-president, in the chair. The minutes of last meeting were read and approved. The paper for the evening was on "Botany," by Mr. Henderson, who treated his subject in a remarkably concise and lucid manner, which could not fail to elicit the warm approbation of the members. At the close of his paper Mr. Henderson intimated his intention of presenting to the junior members of the society a prize for the best collection of flowering plants gathered during the summer. This prize he meant as a stimulus to them to join at once the class about to be started for the prosecution of botany during the summer months, and as that science was one of the subjects for examination under the new Pharmacy Act, he trusted they would see the propriety of embracing the present favourable opportunity of making themselves proficient in such an important branch of their ordeal. So that no time might be lost, he hoped to see a very full turn out of members—juniors and seniors—at next meeting, when an arrangement could be made. Mr. Henderson's announcement was received with much applause. One or two prizes for other subjects were spoken of, and will be brought forward in due time. Votes of thanks to the Chairman and to Mr. Henderson terminated the proceedings.

MANCHESTER CHEMISTS' AND DRUGGISTS' ASSOCIATION.

The third monthly meeting was held at Union Chambers on Friday, February 5th, at 3 p.m. Mr. Brown, Vice-President in the chair. Mr. Hampson read a paper on the "Question of Remuneration and Uniform Prices," of which the following is a brief abstract. The author drew attention to the exceptional character of the trade in medicines. It is impossible to extend the practice of pharmacy beyond the requirements of the public, and its onerous duties and great responsibilities are inadequately remunerated. He took as an illustration the amount of work done in dispensing a prescription for a box of six pills, and the usual charge of sixpence which is made. The low educational condition of our body compared to Continental Pharmacists accounts in some degree for this, but the passing of the Pharmacy Act of 1868 will mark an era in the annals of Pharmacy in England. It is quite possible for us by a closer and more friendly union, and by a higher estimation of our duties and responsibilities, to raise our position to its true level, and in the end receive a more equitable reward from the public.

Upon the accurate and careful manipulation of the dangerously concentrated poisonous remedies which modern science has brought into use the life or death of our customers depends, and it is necessary to remember that the training of those entering the trade will now cost more in time and money than formerly, and assistants when thus qualified will naturally expect, and be entitled to, higher remuneration. In addition to this, may be mentioned, the great increase in rents, etc., and the gradual increasing cost of drugs, as pointed out in the "CHEMIST AND DRUGGIST" for January. He thought the present utter want of system in dispensing charges might be remedied; he was in favour of a scale which should depend on the number of doses—if the leading chemists would unite in arrangement of prices they might afford to leave uncalcalated those who cut prices down to the lowest possible ebb, that they may attract customers to their shops, and forget or ignore the moral relationship they bear to the rest of the trade. He would suggest that a higher rate should be charged for dispensing after business hours. The public has no right to expect from us extra night service, without paying us in proportion to the accommodation it receives. In conclusion, the author urged the chemists of Manchester and surrounding towns to give place to an enlightened spirit of association, which the ultimate elevation of the trade demands. An animated discussion took place on the subject, and a vote of thanks was unanimously passed to Mr. Hampson, for his valuable paper, and he was requested to allow the same to be printed and circulated amongst the members.

A committee was appointed to arrange a table of dispensing charges, to be submitted to the next meeting, to be held on the evening of Friday, March 5th, at 7.30 p.m., on which occasion Mr. Benger would read a paper "On some of the Effects and Applications of Current Electricity," to be illustrated by experiments.

LAW AND POLICE.

THE STORAGE OF DANGEROUS GOODS.

On the 28th ult. Mr. William Hughes, a Liverpool merchant, was summoned before the Liverpool stipendiary for having sent to the Sandon Dock one case of hydrochloric acid, without being marked "dangerous goods." This being the first case of the kind which had come under the special act before the magistrates a mitigated penalty of £10 was imposed.

ACCIDENTS.

SUFFOCATION BY SULPHURETTED HYDROGEN.

On the 1st instant a young man, named Cooper, employed at the chemical works of Mr. Ingham, Southgate, Bradford, entered a condensing boiler, for the purpose of cleaning it, the worm having ceased to operate, in consequence of crystallisation. He immediately fell, overpowered by the sulphuretted hydrogen. Another young man, named Ingham, entered the boiler, to rescue Cooper, but he also became unconscious. Isaac Sykes, a man of large experience, then entered the boiler, while others held a rope, which was fastened round his waist, and very shortly brought out both men. Cooper died in a few minutes afterwards, and Ingham is now in a dangerous state.

DEATH FROM THE IMPROPER ADMINISTRATION OF CARBOLIC ACID.

The circumstances attending the death of Thomas Price, at the Worcester Infirmary, were inquired into on the 2nd inst. From the evidence given before the coroner it appears that the deceased was a farmer, residing at New Radnor, and that he had undergone a surgical operation in the Infirmary, for urinary fistula of the perineum. On the 31st ult. an enema, intended for another patient, was administered to him in mistake, and the surgeons who made the *post mortem* examination concurred in the opinion that death had resulted from the improper administration of carbolic acid. The jury, after a long inquiry, returned the verdict "That the deceased died from the effects of carbolic acid, administered in an enema, on the 31st of January, 1869; but there is no evidence to show that any person was guilty of gross negligence for causing such administration."

GOSSIP.

SALT has been found at a depth of 472 feet, near Segeberg, in Holstein. The discovery is the more valuable, as the proximity of the North Sea on the one side, and the Baltic on the other, will afford a cheap and easy means of carriage.

The biennial oration in memory of the celebrated John Hunter, is delivered to-day (February 15), by Mr. Richard Quain, F.R.S., Surgeon-Extraordinary to the Queen, and President of the College.

At a meeting of the Council of the Royal College of Surgeons, held on the 11th inst., Mr. Richard Partridge, F.R.S., late President of the College, was re-elected a member of the Court of Examiners for a second quinquennial period.

Trade Memoranda.

We desire to call the attention of the trade to the important notices which appear among our advertisements this month respecting the Petroleum Act. The one is issued by the Metropolitan Board of Works, and indicates the chief features of the Act, and the position of that body with reference to it; the other emanates from several large and well-known firms, who thus announce that in consequence of this Act they will be no longer able to supply benzine to their customers. We believe that advice has been taken, which decides that benzine falls under the Act—as, indeed, it must do—and it is therefore important for all those who sell this (and, in some form or another, nearly all druggists do) to bear in mind that for the future they must obtain from the local authorities, or in London from the Metropolitan Board of Works, a licence for this purpose, and must also be careful in every case to affix on each bottle a label worded as the Act directs, and which will be found in the Abstract which appeared in our last month's issue.

The working of the Pharmacy Act cannot fairly be judged of for some years to come, but at present there does not seem to exist any causes for apprehension that it will cause much difficulty. The absurdity of putting poison labels on paregoric, syrup of poppies, and such comparatively harmless compounds is nearly sure to result in a depreciation of the horror which ought to surround that title; and this is clearly one of the weakest points of the Act. In very rural districts, we apprehend, it will be a long time before the restrictions will have sufficiently penetrated to cause the annoyances which will inevitably be inflicted when the huckster shopkeeper tells his bewildered customers that they must go to the nearest registered chemist for their supply of syrup of poppies and Godfrey's. We anticipate, from many letters which we have received, that many have got on the register without a proper claim; and, from our experience of the dilatoriness of human nature, we have little doubt that many of the "rightful heirs" to that title are self-excluded by their own delay. We have still, however, good hopes that all will work well, and will result in much benefit to ourselves as well as the public.

The limited Trade Directory which we published in our Almanack was found so useful, that the desirability of having something of the kind among our own advertisement pages has been suggested to us. We hope to commence this in our next issue, and shall be happy to forward terms, etc., to those firms who would like their names to appear. By the end of next month we hope to have a specimen page ready.

Apropos of the Almanack, we may mention that this useful little work has now reached a fourth edition. The general favour with which it has been received leads us to hope much for future issues, and if in the course of the year some good ideas on the subject should occur to any subscriber, we shall be much obliged if he "will make a note of" the same, and let us have it. Various critical notices of the Text-book will be found elsewhere.

The large firms of Bewley, Hamilton and Co., and George Oldham and Co., both of Dublin, have amalgamated their businesses, which will in future be carried on under the title of Hamilton, Oldham, Long, and Co.

Liquor Calcis in Albuminuria.—A German practitioner recommends lime water as a diuretic in acute Bright's Disease and general anasarca. He used it with success in one case, the urine gradually increasing, the albumen diminishing, and the tube casts increasing.

GAZETTE.

BANKRUPTS.

Gould, James, Woolwich, chemist.
Hardwicke, William, Fulham-place, Paddington, surgeon.
Raynor, J., Pudsey, drysalter.
Roberts, W. R., Barnesly-le-Wold, surgeon.
Sandford, E., Baschurch, surgeon.
Underhay, S. F., late of Handley, Dorsetshire, apothecary.
Walker, J. F., Dudley, drysalter.

PARTNERSHIPS DISSOLVED.

Laurie and Jordan, Queen Anne-street, Cavendish-square, dental surgeons.
Locking, J. A., and Ridsdall, W. E., Kingston-upon-Hull, surgeons.
Lucas, J. W., and Graydon, S. J., Wilhington, surgeons.
Newton, W., and Crofts, H., Scarborough, veterinary surgeons.
Pearse, E., and Dingley, W., Tavistock-square, surgeons.
Sedgwick, C., jun., and Sedgwick, C., sen., Nottingbourne, Kent, surgeons.

Notes and Queries

Hydrargyri Subchlorid and Ammon. Carb.—*J. Robinson* (Chester-le-street) writes:—Perhaps you will allow a "beginner in chemistry" a small space in your valuable journal to make a few remarks. I had an order from a surgeon for a few chemicals, among which were hydrar. subchlor. and ammon. carb. Never dreaming of any decomposition I put them all into one parcel. A few days after the calomel was returned, marked "wrong," and on opening the packet I found a dingy grey powder. I at once suspected the ammonia had something to do with it, so I put a little calomel into a wineglass, and added about 3ss. liqr. ammoniæ, which immediately deposited a black precipitate (black oxide of mercury).

I have written the above as I thought some of my brother chemists might, having similar orders, put them up in the same style as I did, and so lose a parcel of calomel. To remedy this evil I would recommend it to be put into a bottle.

Applications for Scabies (Itch).—The remedy recommended by Vleminckx is a solution of calcium sulphide, made according to the following form:—

Take of quick lime	...	...	1 lb.
Water	...	...	q.s. to slack.
Sublimed sulphur		...	2 lbs.
Water	...	...	20 lbs.

Mix and boil until reduced to 12 lbs., and filter.

The medicine is employed as follows:—The patient is put in a warm bath, and remains there half an hour, then all the parts affected by the itch are rubbed by a piece of flannel dipped in the solution as above, and the patient returned to the bath for half an hour. The next day this treatment is repeated, and usually is sufficient to cure.

Prof. Hébra, for women and persons with delicate skins, often employs the following mixture:—

Petroleum oil (Seneka oil),
Alcohol, of each an ounce,
Balsam of Peru, a drachm,
Oil of Rosemary,
Oil of Lavender,
Oil of Lemon, of each 22 grains—Mix.

A tincture of *Pyrethrum Roseum*, made with dilute alcohol, has recently been recommended as a remedy in scabies. The application is said to give prompt relief from itching.

Indianite.—This new cement is prepared by mixing one hundred parts of finely chopped rubber with fifteen parts of resin and ten parts of shellac; and dissolving the whole in bisulphide of carbon. It is said to be useful in joining wood and metals.

Lotion of Glycerine and Cantharides for the Hair.—The following form is given in a French medical journal:—Take of aromatic spirit of Ammonia, 15 drachms troy; Glycerine, 8 drachms troy; Tincture of Cantharides from 2 to 4 drachms troy; Distilled Rosemary water, 20 ounces troy—mix. To be applied to the roots of the hair by rubbing in small quantities once or twice a day, to stimulate the growth.

Applications for Prurigo.—Neligan extols an ointment

made by mixing half a drachm of chloroform with an ounce of cold cream. The following lotion has been recommended, applied warm two or three times a day: ℞, Hydrarg. bichlorid., gr. iv.; Bism. carb., dr. ss; Acid. hydrocyan., dr. ss; Liq. calcis ad. oz. viij. A solution of Potassa sulphurata in water is sometimes very effectual—dr. ij to oz. iv.

To Prevent Adhesion of Glass Stoppers.—Much difficulty is frequently experienced by druggists and others in removing the glass stoppers used in bottles which contain solutions of caustic potash and soda, lime-water, Goulard's extract, etc. All this trouble may be prevented by dipping the stoppers in melted paraffin, which acts as a lubricant, and is unaffected by these solutions.

Preservation of Drugs from Damp.—In pharmacies where any dampness prevails, and there is any danger of the drugs becoming mouldy or spoiling, M. Stanislas Martin recommends the following simple and effectual procedure:—Small wooden or tin boxes, full of quick lime, and having their lids perforated with holes, are to be placed in every box or drawer containing drugs liable to be injured by damp. The air of these receptacles soon becomes dried, and when the oxide of calcium has become hydrated, it must be replaced by new quick-lime. In the same way a great number of deliquescent salts may be preserved—as, for example, the chloride of gold, which is now so much used in the arts. The phial containing the salt is to be placed in another of double its capacity, filling the space with lime, and corking hermetically.

To Disguise the Taste of Quinine.—A writer in the *Philadelphia Medical and Surgical Reporter* says that the most effectual mode of disguising or destroying the taste of quinia is to chew a few chocolate drops immediately after taking the medicine.

To Preserve Ergot, Cantharides, and other substances liable to the depredations of insects, it is recommended to put a small quantity of sulphuric ether in the bottle containing them.

Tincture of Digitalis in Ear-ache.—For ear-ache it is recommended to drop two or three drops of this tincture in the ear, and then insert a plug of cotton.

Correspondence

THE NEW PETROLEUM ACT.

TO THE EDITOR OF THE CHEMIST AND DRUGGIST.

Sir,—In answer to many inquiries concerning the Petroleum Act described in your last issue, allow me to state that benzol, as a mineral product, unquestionably comes under the Act; ether, as a vegetable product, does not. Hence, doubtless the deduction will be drawn that dealers in ether should be allowed to sell the less dangerous benzol without restriction; that, in fact, pharmacists should have been exempted from the new law. But it is the public, not chemists, who are to be educated to recognise the inflammable properties of these lamp-oils and spirits, and as the public frequently, except in large towns, purchase such materials of pharmacists, exemption of the latter would have been most mischievous.

Wholesale and retail chemists and druggists and vendors of proprietary articles will find that the Act itself does not cause an unreasonable amount of trouble in requiring them to carry out its praiseworthy object of further protecting life and property from fire. Local licensing bodies, however, who are just now making regulations as to the storage of petroleum by oilmen, may unconsciously cause a vast deal of annoyance to those pharmacists who do not sell burning oils in any form, and only benzol or petroleum in little bottles under the name of glove-cleaning liquids. It is for such gentlemen, or perhaps the Pharmaceutical Society in their name, once for all to memorialise the Home Secretary with a view to the adoption of some rule whereby local conditions of licence which are unnecessarily irksome to pharmacists may be modified in the case of persons not dealing in lamp oils. Clause 6 of the Petroleum Act of 1862, which is read as one with that of 1868, specially provides this course in anticipation of difficulties such as those above mentioned.

I am, &c.

The Professor of Practical Chemistry to the Pharmaceutical Society, and London Analyst to the Fire Offices.

APRONS.

TO THE EDITOR OF THE CHEMIST AND DRUGGIST.

Sir,—In these days of swift transformations, if not of reforms, the druggist's apron shows evident signs of wearing out. But if this venerable institution is doomed to disestablishment, I do not believe that its decay will be much deplored. Some of us remark with pleasure that the usual graceful figures and becoming costumes of our brethren in the trade are gradually emerging from their primitive coverings and are hopefully looking forward to a time when an aproned pharmacist will be regarded as a living anachronism.

It is true that in many of our best establishments, both in town and country, the apron uniform is still retained, and some principals would just as soon see their assistants with primrose kids on behind the counter as see them without their aprons. They regard the covering as the sheet-anchor which keeps the "young men of the period" who are in the drug trade, as well as in other positions, to their moorings.

Let no chemical coxcomb, however, expect that a word of sympathy for him is coming from me. Let no languid apprentice who chafes at the drudgery of making horse-balls or ointments turn to this letter for encouragement in his lofty aspirations for something more congenial to his tastes. An apprentice has not learnt his business thoroughly who does not know how to handle Venice turpentine with dexterity, how to beat up heterogenous elements into a plastic mass, how to clean measures and mortars, and how to dust bottles carefully, quickly, and entirely. To read and dispense a prescription is an acquirement which will soon be attained by a lad of intelligence, and he will be far better fitted for it if he has obtained, by patient practice, a thorough command over his utensils, and a perfect acquaintance with his raw materials. For the first two or three years of his training his muscles should have more exercise than his brains; and while I much condemn the youth who is *beneath* his work, I have far more contempt for him who thinks himself *above* it. By all means, gentlemen, tie up your apprentices and juniors in aprons—if up to their necks so much the better—and give them plenty of dusty, dirty work to do, so long as it is in some way connected with the profession, which you are bound to teach them.

In the laboratory and the warehouse aprons are necessities, and should never be cast aside; but at the chemist's counter I submit with the greatest deference to those whose experience and judgment is greater than my own, that the garb is a little out of place. It is quite right and looks very proper to see the lady of the house with her apron on as she stands at the kitchen-table, but she is sure to have sufficient self-esteem to doff it when she goes into the parlour or the drawing-room. And so it is perfectly in character for the grocer, whose shop corresponds with the kitchen of the house, to dress himself ready for his duties. But the chemist's shop ought to be the best room in the house, and customers expect from him a little more—gentility, I should have said, if the word expressed its etymological meaning. Still all this goes for nothing if the apron is of any real service, and one way or another this question may very soon be settled.

I presume beyond its appearance, which of course comes to a question of taste, the one recommendation upon which its existence can be defended is that it promotes cleanliness. Now, whenever there is convenience elsewhere, the shop ought not to be the place for dirty work; and all the lighter work of a retail and dispensing business ought to be done with such manual dexterity that scarcely even the fingers should be soiled. A good supply of dusters and towels should always be at hand, and the work of these should be divided, and each kept sacred to its duties. But does not the young

assistant, enrobed with a clean apron, feel himself quite independent of dusters? If he get some tincture of iodine on his fingers, or pour some castor-oil over the side of a bottle which he is attempting too impatiently to fill, the apron naturally occurs to him as the readiest and most capacious receiver of the mess and remover of the difficulty. He uses it to wipe his bottles, his hands, his counter, and sometimes even, though in very exceptional instances, his nose. Does this practice then conduce to the cultivation of habits of cleanliness? Is it not rather a stimulant to laziness, if the paradox may be permitted, and encouragement to dirtiness? And who would be the most likely to be careful with his dress and the many dusty and dirty drugs or chemicals with which it might come into contact—he who covers it up with a cloth and thinks himself at liberty to omit every other precaution, or he who knows that his becoming appearance depends on his own carefulness and skill? Look on this picture and then on that, and if any champion of usage or friend of the laundress can give me any sound reason for retaining in my shop and on my person this remnant of superstition and of the cellar, let him come forward. But I cannot accept as a sound reason the simple assertion that the apron is a "flag which has braved a thousand years," though it seems in some cases almost literally true.

There are many shops that always look clean, neat, and attractive, in which one never sees hampers or boxes, or bags set just by the entrance, as though purposely intended to upset the unwary customer, and I have always thought that an apron fastened round the waist of the owner of such an elegant *boudoir* was badly out of place, and disparaged the character which he had otherwise given to his sanctum.

What a pity it is that the genteel chemist sometimes walks from his counter and his desk to the Bankruptcy Court! Perhaps, after all, the apron protects the pockets in more senses than one of those who wear it. I fear that the successful man of business is too often one who stands with the utmost complacency behind the dirty old rag (turned on Thursdays), and who from the time he dons it in the morning until the hour when he lays it aside at night never ceases to assume the incivility and bearishness which he regards as inseparable from business. How hard it is to judge from observation what course it is best to take to ensure success!

Yours truly,
COUNTERSIGN.

Varia.

WORM-DOCTORS.

The "worm-doctor" is by no means an exclusively modern animal. He has flourished for many centuries in metropolitan cities, always with the same inviting show of a window full of bottled worms, procured from cats and dogs, and sometimes from human subjects. The worm-doctor sees nothing else and cures nothing else—but his specialty. All his patients have worms, mostly tape-worms, and he does them all with the same vermifuge, *male fern* generally. In one of fifty or a hundred cases the vermifuge finds an enemy and routs him; and forthwith the trophy takes its place in the window, with name and date. More frequently the art of the worm-doctor succeeds by another method, and a single experienced worm may come from twenty confiding patients. Some of the old London worm-doctors were great men in their way. Timbs tells us of one named Gardner, who used to ride a huge roan horse, and had a fine tomb erected for himself, with a brief and sententious inscription. But finding that people inferred from it that he was dead, and that it hurt his business, he had a word interpolated so that it stood thus:

"Dr. John Gardner's last and best bed-room."
intended
—*Pacific Med. and Surg. Journ.*

PEPSIN IN CHOLERA INFANTUM.

Dr. Hawley, of Green Point, N.Y. (*Buffalo Medical Journal*) recommends pepsin in the advanced stages of cholera infantum and other diseases of children in which the digestive power is weakened. To a child a year old he gives five grains every three hours, combining it sometimes with an equal quantity of subnit. bismuth.

ANATOMICAL MUSEUMS.

One of the most important duties of the new Commissioner of Police will be to systematise and render effectual the now spasmodic action of the police in using the powers of the law against flagrant violations of public decency. The so-called public "anatomical museums" exist only by the sufferance of the police. Lord Campbell's Act would suffice at once to destroy these haunts of pollution and mischief. We owe it to Mr. Knox that one part of London has been, to some extent, rendered less publicly obnoxious; and we hope that the omen is good in other respects.—*Brit. Med. Journ.*

AN APROPOS SOLILOQUY.—BY A GIRL OF THE PERIOD.

To dye, or not to dye, that is the question:—
"Whether 'tis nobler in the mind, to suffer"
Th' outrageous colour of Dame Nature born,
The very "head and *front* of my offending"
Against the fiat of chameleon Fashion,
Or summon Art to aid me? Shall I end
This heart-ache by the "hazard of a dye"
That Fashion dooms my hair to?—Dye:—a wash:—
No more:—Poison, perhaps? ay, that's the rub
To bring paralysis: the '*harmless wash*'
With lead, and sulphur, from the depths profound
Of Acheron, is loaded: and who knows
But when I shuffle off last season's coil,
And tone the little hair I call my own
To match my latest chignon's altered hue,
Disease in my 'frizzettes' may lurk unseen,
Stride my back-comb, or stalk with cat-like tread
Along the parting? Let me pause, and think
How much respect to chemistry be due—
For who would bear the sneers and up-turned nose
Of female friend, the criticising eye
Of street-cad,—when (as all the Papers tell)
She can herself the remedy procure
For thirteen stamps,—but that a hazy dread
Of something that may happen cramps the will,
And knowledge makes a coward of the purse?
'Tis too much proved:—yet I obey thy call,
Stern mother of invention! Truefitt, in thy orisons
Be all my fears remembered . . . . . .
The Tomahawk.

TRANSPARENT COLOURS.

There are several colours that are naturally transparent; others that may be made so by mixture.

The transparent colours are Terre de Sienna, Asphaltum, Dragon's Blood, Carmine, Rose Pink, Chemical Brown, all the Lakes, Gamboge, and all the Gums.

Semi-transparent—Umber, Vandyke Brown, Chrome Red, Emerald Green, Brunswick Green, Ultramarine, Indigo, Verdigris.

Remarks.—These colours should be ground very fine and spread on evenly.

If to be shown with a strong light two coats may be given; but if a subdued light one coat is better.

Transparent colours are purer if elutriated; that is, ground fine in water; let it settle; pour off the top part of the settlings; mix that up with more water; let it settle, and take the top half of that, which will be free from all sand and grit. If the pure part of the pigment, however, should be the heaviest, discard the top and use the bottom of the sediment. Usually, however, the purest colouring part settles upon the top.

Any of these colours will work more evenly, and be more transparent, if a small quantity of water be mixed while grinding.

Turpentine makes transparent colours work crumbly.

Bleached boiled oil, or white varnish, is the best vehicle for flowing evenly. Raw oil does very well, only that transparent colours are always difficult to dry.—*The Painter's Manual.*

THERAPEUTIC EFFECTS OF LUPULINE.

M. Méhu finds that the resin of hop, in the dose of twenty to thirty grains, produces often an immense headache; sometimes nausea, and even slight vertiyo; and always a state of insensibility, lasting several hours, but without hallucinations such as haschish causes. Each time he has found a subsequent and notable increase of appetite.—*British Medical Journal.*

TRADE REPORT.

DRUGS.

Business is certainly a little more active in all quarters, and in the Drug Market prices have ruled somewhat higher during the past month.—TURKEY OPIUM maintains its advanced price of 49s. GUM ARABIC has slightly advanced. RHUBARB is somewhat dearer. CASTOR OIL and CARDAMOMS are lower. BERGAMOT is a little easier.

ALOES: 35 cases Cape sold, common to fair rather soft 21s. 6d. to 29s. Of 51 boxes East India 6 cases good fair Hepatic rather soft sold at £7, the remainder bought in, middling £6 and Socotrine at £10, and 2 kegs rather ordinary Hepatic at 85s.

CUBEBS sold at 40s. to 40s. 6d.

GUMS.—Gamboge £13 10s. to £14; Myrrh £9 to £9 7s. 6d. for good small; Arabic, E. I. sold at 75s. to 76s., of Turkey, 26 cases bought in seconds at £8 to £8 10s.; Benjamin £25 10s. to £26; Copal 279 boxes Manilla sold at 33s. to 35.; Tragacanth bought at £19; Assafœtida 90s. to 97s. 6d.; Ammoniacum £13.

IPECACUANHA: 2 cases sold at 5s. 3d. to 5s. 9d.

JALAP bought in at 2s. 8d. to 3s. 4d.

NUX VOMICA sold rather lower at 11s.

SARSAPARILLA: 33 bales sold at 2s. 1d. to 2s. 4d.

SENNA: 9 cases sifted Alexandrine bought in at 10d.

CHEMICALS.

The following items of interest and importance relating to the Chemical Markets during the past month have been furnished to us by Mr. William CAUDERY, of 6, Biliter Square.

The general tone of the Chemical market during the past month has been quiet, and with a few exceptions prices remained as last mentioned.

SODA: Crystals were quoted all through at £4 5s. ex-ship, but the trade here being very limited a reduction of 2s. 6d. per ton had in some instances to be submitted to; in Newcastle, however, where there was more demand, makers were very firm in their quotations. Ash was very quiet at 1½d. per cent. per cwt. ex-ship. Bicarb at 11s. landed. In Caustic a fair business done but price gave way slightly, opening at 14s. 9d. and closing at 14s. 3d. to 14s. 6d. for best white 60 to 62 per cent.

ACIDS: In Tartaric a good business was transacted at advancing prices up to 1s. 2½d. for English, and 1s. 2d. for Foreign, but at the moment, although makers are very firm in their quotations, the market is quiet. Citric was steady throughout at 2s. 9d., with transactions to an average extent.

CREAM OF TARTAR was firmly held at 85s., but now everything offering thereat is cleared off, and 87s. 6d. is the price.

SULPHATE OF QUININE has advanced, and a large business done, and Pelletier's closing at 5s. 2d., and English at 5s. 6d.

BLEACHING POWDER quiet but steady at 10s. 9d. to 11s.

SAL AMMONIAC very firm at 38s. for firsts, and 36s. for seconds.

SULPHATE OF AMMONIA—Best white was rather more plentiful, but price remained at £16 15s. to £17, but for brown and discoloured there were rather buyers than sellers at the proportionate reduction in price.

SUGAR OF LEAD in fair demand at 40s.

POTASH.—Chlorate and Bichromate both higher, 12d. being the price of the former, and 5½d. of the latter.

SULPHATE OF COPPER.—26s. per cwt. required, but not much business transacted.

ALUM was steady at £7 10s. to £7 15s. for lump, and £8 10s. to £8 15s. for ground.

GREEN COPPERAS has been in excellent demand throughout, at from 57s. 6d. to to 62s. 6d. per ton.

OILS.

LINSEED has advanced to £27 15s.

RAPE is firmer at £32 10s.; for July to October £34 to £35 10s.

OLIVE is still declining in price although we hear that the qualities imported are now very superior.

PALM OIL very quiet.

SPERM is held firmly at £96 to £97.

PALE SEAL is more in request at £36, and COD at £36 10s.

PETROLEUM is dearer at 1s. 11d. to 2s.

TURPENTINE is firm at 33s.

Monthly Statement

Of the STOCKS, LANDINGS, and DELIVERIES of the following GOODS at the PORT of LONDON, from Jan. 1 to Jan. 31, 1869 and 1868.

	Stock Jan. 31.		Landings.		Deliveries	
	1869	1868.	1869.	1868.	1869.	1868.
Aloes .... cases	2803	3144	150	147	149	173
kegs	73	111	—	—	—	1
gourds	883	1550	10	—	105	203
Aniseed, Star .....chests	410	320	—	—	56	14
Arrowroot ..... casks	12787	12648	702	627	1003	715
boxes and tins	18021	18679	132	414	755	843
Balsam ..... casks, &c.	244	253	—	37	282	33
Bark, Medicinal, casks and cases	262	312	39	6	9	—
serons, &c.	7006	8873	1369	2161	850	1053
Bark, Tanners..... tons	100	74	1	—	1	—
Borax..... packages	133	83	—	2	—	10
Bees & veget. wax bales & serons	665	186	230	42	39	106
casks and cases	836	1446	148	114	105	55
cakes	1579	1406	436	145	—	154
Brimstone..... tons	—	—	—	—	—	—
Camphor ..... packages	3402	1634	2018	—	1937	171
Cardamoms ..... chests	56	76	—	15	31	29
Cochineal—						
Honduras ..... serons	2417	3286	71	69	363	198
Mexican ..... ,,	181	733	42	136	145	103
Tenerife ..... ,,	7629	7995	2204	4478	1576	1578
Coculus Indicus ..... bags, &c.	1512	983	—	—	64	10
Colombo root ..... packages	1840	2117	—	3	—	218
Cream of Tartar..... casks	17	262	5	18	6	21
Cubebs ..... bags	2155	1281	—	—	30	1
Dragonsblood ..... chests	177	112	27	26	14	11
Galls, E. I. .... casks and cases	4517	2607	476	724	813	75
Mediterranean ..... sacks	29	27	14	—	—	43
Gum—						
Ammoniac ..... packages	196	191	—	7	7	3
Animi and Copal .. ,,	1697	1084	310	19	504	185
Arabic, Barbary .... ,,	88	130	47	23	19	53
Turkey ..... ,,	57	43	—	1	2	20
East India..... ,,	2936	1575	928	682	148	133
Assafœtida ..... ,,	89	123	—	70	4	42
Benjamin ..... ,,	1443	1021	325	282	121	117
Dammar ..... ,,	1118	1046	—	21	155	95
Galbanum ..... ,,	2	3	—	—	—	3
Gamboge ..... ,,	138	94	15	25	21	4
Guaiacum ..... ,,	94	84	35	—	16	—
Kino ..... ,,	186	99	—	—	16	—
Kowrie ..... tons	1058	1539	228	22	66	160
Mastic ..... packages	183	232	—	—	—	1
Myrrh, E. I. ..... ,,	104	57	86	49	30	25
Olibanum ..... ,,	1712	1354	100	265	123	111
Sandarac ..... ,,	529	187	341	87	72	39
Senegal ..... tons	78	66	6	2	6	
Tragacanth ..... packages	22	35	—	3	—	6
Ipecacuanha .... casks and bags	81	91	24	3	17	35
Jalap ..... bales	232	313	35	75	49	16
Lac-Dye.....chests	3432	3541	356	643	426	687
Nux Vomica..... packages	4212	405	310	90	1552	33
Oil—						
Castor ..... casks	103	87	—	4	5	—
cases	1316	442	200	265	236	250
dppers and tins	12824	12864	3500	9520	1741	1284
Palm ..... tuns	1773	737	599	493	358	411
Cocoanut ..... ,,	4043	3363	1041	623	456	549
Olive ..... casks, &c.	1135	1323	1005	138	585	491
Aniseed..... cases	194	75	84	—	48	22
Cassia ..... ,,	765	360	60	15	48	92
Opium .....chests, &c.	237	313	—	—	no	return
Rhubarb .....chests..	1783	526	263	116	249	109
Safflower—						
Bengal ..... bales	2110	1876	703	622	396	490
Bombay..... ,,	136	69	3	—	49	27
Saffron ..... packages	12	10	7	1	5	1
Sarsaparilla ..... bales	426	291	295	107	250	152
Senna..... bales, &c.	2186	2322	3	360	183	230
Shellac ..... chests, &c.	9640	12608	494	1667	932	1161
Sticklac..... ,,	4754	2756	1368	8	243	56
Terra Japonica—						
Gambier ..... tons	3529	2497	813	1581	527	566
Catch..... ,,	1232	510	37	229	300	128
Turmeric ..... ,,	971	896	294	156	203	64
Vermillion..... chests, &c.	100	75	—	—	14	6

Monthly Price Current.

[The prices quoted in the following list are those actually obtained in Mincing-lane for articles sold in bulk. Our Retail Subscribers must not expect to purchase at these market prices, but they may draw from them useful conclusions respecting the prices at which articles are offered by the Wholesale Firms.]

	1869. Jan.				1868. Jan.			
CHEMICALS.	s.	d.	to	s. d.	s.	d.	to	s. d.
ACIDS—								
Acetic .....per lb.	0	4	..	0 0	0	4	..	0 0
Arsenious (*see* Arsenic)								
Citric .....per lb.	2	9	..	2 10	1	10	..	0 0
Nitric ..... ,,	0	5	..	0 5½	0	5	..	0 5½
Oxalic ..... ,,	0	8	..	0 8	0	8½	..	0 0
Sulphuric ..... ,,	0	0¾	..	0 1	0	0¾	..	0 1
Tartaric crystal .. ,,	1	2½	..	1 2½	1	1½	..	0 0
powdered ,,	1	2½	..	0 0	1	2	..	0 0
ANTIMONY ore.....per ton	280	0	..	300 0	300	0	..	320 0
crude ...per cwt	27	0	..	0 0	21	0	..	23 0
regulus.. ,,	48	0	..	49 0	45	0	..	0 0
star .... ,,	48	0	..	0 0	45	0	..	0 0
ARSENIC, lump..... ,,	16	0	..	16 6	16	0	..	16 6
powder.... ,,	7	6	..	8 0	7	3	..	7 6
BRIMSTONE, rough ..per ton	132	6	..	132 6	132	6	..	135 0
roll ....per cwt	12	0	..	0 0	10	3	..	11 0
flour.... ,,	14	0	..	14 6	14	0	..	14 6
IODINE, dry .....per oz.	0	9½	..	0 10	0	9½	..	0 9½
IVORY BLACK, dry..per cwt.	0	0	..	0 0	0	0	..	0 0
MAGNESIA, calcined..per lb.	1	6	..	1 8	1	6	..	1 8
MERCURY..... per bottle	137	0	..	0 0	137	6	..	0 0
MINIUM, red .....per cwt.	20	9	..	21 0	21	6	..	22 0
orange .... ,,	31	9	..	32 6	33	6	..	0 0
PRECIPITATE, red ....per lb.	2	6	..	0 0	2	6	..	0 0
white .. ,,	2	5	..	0 0	2	5	..	0 0
PRUSSIAN BLUE ..... ,,	1	0	..	1 10	1	0	..	1 10
SALTS—								
Alum .....per ton	150	0	..	155 0	150	0	..	155 0
powder .... ,,	170	0	..	175 0	170	0	..	175 0
Ammonia:								
Carbonate .....per lb.	0	5¾	..	0 6	0	5	..	0 5½
Hydrochlorate, crude, white..... per ton	500	0	..	510 0	400	0	..	500 0
British (*see* Sal Ammoniac)								
Muriate (*see* Hydrochlorate)								
Sulphate .....per ton	320	0	..	340 0	280	0	..	290 0
Argol, Cape .....per cwt	70	0	..	82 6	65	0	..	75 0
France .... ,,	45	0	..	60 0	48	0	..	70 0
Oporto, red ,,	25	0	..	27 0	26	0	..	28 0
Sicily .... ,,	45	0	..	50 0	50	0	..	55 0
Naples, white ,,	55	0	..	65 0	60	0	..	70 0
Florence, white	70	0	..	75 0	75	0	..	80 0
,, red ,,	60	0	..	65 0	65	0	..	70 0
Bologna, white ,,	0	0	..	0 0	78	0	..	80 0
Ashes (*see* Potash and Soda)								
Bleaching powd...per cwt.	10	9	..	11 0	10	6	..	0 0
Borax, crude .... ,,	25	0	..	40 0	25	0	..	35 0
(Tincal) .. ,,	40	0	..	58 0	25	0	..	55 0
British refnd. ,,	70	0	..	0 0	50	0	..	52 6
Calomel .....per lb.	2	5	..	0 0	2	5	..	0 0
Copper:								
Sulphate .....per cwt.	26	0	..	27 0	24	6	..	25 0
Copperas, green ..per ton	57	6	..	66 0	55	0	..	57 0
CorrosiveSublimate..p.lb.	1	11	..	0 0	1	11	..	0 0
Cr. Tartar, French, p. cwt.	85	0	..	0 0	78	0	..	80 0
Venetian grey ,,	70	0	..	0 0	70	0	..	0 0
brown ,,	62	6	..	65 0	54	0	..	60 0
Epsom Salts ....per cwt.	8	0	..	8 6	8	0	..	9 0
Glauber Salts .... ,,	5	6	..	6 0	5	6	..	6 0
Lime:								
Acetate, white, per cwt.	12	6	..	21 6	15	0	..	22 0
Magnesia:								
Carbonate..... ,,	42	6	..	0 0	42	6	..	0 0
Potash:								
Bichromate ....per lb.	0	5	..	0 0	0	5	..	0 5½
Carbonate:								
Potashes, Canada, 1st sort .....per cwt.	32	6	..	33 0	33	0	..	0 0
Pearlashes, Canada, 1st sort .....per cwt.	33	0	..	0 0	37	0	..	0 0
Chlorate .....per lb.	1	0	..	1 1	1	0	..	1 0
Hydriodate (*see* Potassium, Iodide)								
Muriate (*see* Potassium, Chloride)								
Prussiate .....per lb.	0	11¾	..	1 0	1	0	..	1 1
red.... ,,	1	9½	..	1 10	1	9½	..	1 10
Tartrate (*see* Argol and Cream of Tartar)								
Potassium:								
Chloride .....per cwt.	8	3	..	8 6	8	0	..	8 6
Iodide..... per lb.	11	6	..	0 0	11	9	..	0 0
Quinine:								
Sulphate, British, in bottles .... per oz.	5	2	..	0 0	4	3	..	4 6
Sulphate, French ,,	4	9	..	0 0	4	0	..	4 1
Sal Aectos .....per lb.	0	10½	..	0 0	0	10½	..	0 0
Sal Ammoniac, Brit. cwt.	36	0	..	38 0	33	0	..	34 6
Saltpetre:								
Bengal, 6 per cent. or under .....per cwt.	24	3	..	24 6	19	0	..	19 6
Bengal, over 6 per cent. per cwt.	23	9	..	24 0	18	3	..	19 0
Madras..... ,,	22	0	..	23 0	16	6	..	18 6
Bomb & Kurrachee p.ct.	0	0	to	0 0	17	0	to	18 0
European..... ,,	0	0	..	0 0	21	6	..	22 6
British, refined ,,	29	6	..	30 0	22	9	..	23 6

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Soda: Bicarbonate, p.cwt.	10	9	..	0 0	13	0	..	0 0
Carbonate:								
Soda Ash....per deg.	0	1¾	..	0 0	0	2	..	0 0
Soda Crystals per ton.	82	6	..	0 0	95	0	..	0 0
Hyposulphite..per cwt.	18	0	..	22 0	0	0	..	0 0
Nitrate ..... ,,	15	6	..	0 0	10	6	..	11 6
SUGAR OF LEAD, White, cwt.	40	0	..	41 0	37	6	..	38 0
Brown ..... ,,	29	0	..	30 0	28	0	..	29 0
SULPHUR (*see* Brimstone								
VERDIGRIS ..... per lb.	0	11	..	1 1	0	11	..	1 0
VERMILION, English..per lb.	2	6	..	3 0	2	9	..	3 1
China.... ,,	2	6	..	2 9	2	9	..	3 0
DRUGS.								
ALOES, Hepatic....per cwt.	90	0	..	200 0	100	0	..	195 0
Socotrine .. ,,	140	0	..	280 0	130	0	..	300 0
Cape, good.. ,,	29	0	..	31 0	30	0	..	32 0
Inferior ,,	16	0	..	28 0	18	0	..	29 0
Barbadoes ,,	70	0	..	190 0	75	0	..	220 0
AMBERGRIS, grey ....per oz.	25	0	..	37 6	32	0	..	36 0
BALSAMS—								
Canada ..... per lb.	1	3	..	0 0	1	5	..	1 6
Capivi ..... ,,	1	9	..	1 10	1	7	..	1 8
Peru ..... ,,	11	0	..	12 0	8	0	..	0 0
Tolu ..... ,,	2	6	..	0 0	2	7	..	0 0
BARKS—								
Canella alba ....per cwt.	35	0	..	50 0	22	0	..	27 0
Cascarilla..... ,,	23	0	..	35 0	25	0	..	35 0
Peru, crown & grey per lb.	0	10	..	1 10	1	3	..	2 2
Calisaya, flat ,,	2	10	..	3 2	2	6	..	2 9
quill ,,	2	8	..	2 10	2	3	..	2 6
Carthagena ,,	0	10	..	1 6	0	9	..	1 3
Pitayo .... ,,	0	7	..	1 4	0	9	..	1 6
Red ..... ,,	1	9	..	5 6	2	6	..	11 0
Bucho Leaves ..... ,,	0	3	..	0 8	0	2½	..	0 9
CAMPHOR, China.. per cwt.	110	0	..	115 0	140	0	..	0 0
Japan ,,	110	0	..	115 0	140	0	..	0 0
Refin. Eng. per lb.	1	8	..	0 0	1	10	..	11 0
CANTHARIDES ..... ,,	2	2	..	0 0	2	0	..	0 0
CHAMOMILE FLOWERS p. cwt	60	0	..	100 0	45	0	..	80 0
CASTOREUM ..... per lb.	5	0	..	32 0	5	0	..	32 0
DRAGON'S BLOOD, reed p. ct.	100	0	..	220 0	90	0	..	220 0
lump ,,	105	0	..	205 0	90	0	..	210 0
FRUITS AND SEEDS (*see also* Seeds *and* Spices)								
Anise, China Star pr cwt.	97	6	..	100 0	115	0	..	120 0
German, &c. ,,	30	0	..	40 0	28	0	..	40 0
Beans, Tonquin .. per lb.	1	2	..	1 6	1	0	..	1 9
Cardamoms, Malabar								
good ,,	10	0	..	10 6	7	9	..	8 3
inferior ,,	6	6	..	9 0	5	3	..	7 6
Madras ,,	5	0	..	10 6	5	0	..	7 0
Ceylon ,,	2	9	..	3 3	2	10	..	3 0
Corozo Nuts.... per cwt.	12	0	..	16 0	10	0	..	13 0
Cassia Fistula.. ,,	15	0	..	28 0	20	0	..	32 0
Castor Seeds .. ,,	11	0	..	12 0	10	0	..	12 0
Cocculus Indicus ,,	24	0	..	26 0	22	6	..	25 0
Colocynth, apple.. per lb.	0	5	..	0 10	0	7	..	0 11
Croton Seeds .. per cwt.	84	0	..	90 0	90	0	..	100 0
Cubebs ..... ,,	42	0	..	0 0	45	0	..	47 0
Cummin..... ,,	40	0	..	50 0	16	0	..	20 0
Dividivi ..... ,,	10	6	..	12 6	17	0	..	24 0
Fenugreek..... ,,	11	0	..	16 0	11	0	..	12 0
Guinea Grains .. ,,	38	0	..	40 0	45	0	..	48 0
Juniper Berries ,,	7	0	..	8 0	9	0	..	10 0
Myrobalans ..... ,,	11	0	..	17 0	12	0	..	16 6
Nux Vomica..... ,,	13	0	..	14 0	15	0	..	16 0
Tamarinds, East India ,,	30	0	..	32 0	20	0	..	29 6
West India, new ,,	16	0	..	30 0	16	0	..	27 0
Vanilla, large .... per lb.	10	0	..	12 0	9	0	..	14 0
inferior ,,	4	0	..	9 0	4	0	..	8 0
Wormseed per cwt.	25	0	..	30 0	1	6	..	0 0
GINGER, Preserved, in bond (duty 1d. per lb.) per lb.	0	6	..	0 10	0	9	..	0 10
GUMS (*see separate list*)								
HONEY, Native ,,	0	0	..	0 0	0	0	..	0 0
Cuba ,,	21	0	..	36 0	25	0	..	38 0
Jamaica.. ,,	25	0	..	45 0	22	0	..	42 0
IPECACUANHA .... ,,	6	0	..	6 3	7	3	..	7 6
ISINGLASS, Brazil.. ,,	3	2	..	4 11	2	4	..	4 0
Tongue sort ,,	3	6	..	5 0	3	0	..	4 6
East India ,,	2	3	..	4 1	2	2	..	4 4
West India ,,	3	8	..	4 0	3	7	..	4 0
Russ. long staple	8	0	..	9 0	9	0	..	10 0
,, leaf ,,	5	6	..	7 0	6	0	..	9 0
,, Simovia	1	6	..	2 6	1	6	..	2 6
JALAP, good ,,	3	9	..	4 3	4	3	..	5 0
infer. & stems ,,	0	6	..	3 6	0	9	..	3 10
LEMON JUICE .... per degree	0	1	..	0 0	0	0¾	..	0 0⅞
LIQUORICE, Spanish per cwt.	63	0	..	68 0	65	0	..	70 0
Italian ,,	48	0	..	50 0	50	0	..	60 0
MANNA, flaky ..... ,,	3	0	..	3 6	3	9	..	4 3
small..... per lb.	1	3	..	1 9	1	0	..	1 6
MUSK..... per oz.	22	0	..	34 0	21	0	..	38 0
OILS (*see also separate List*)								
Almond, expressed per lb.	1	3	..	0 0	1	10	..	0 0
Castor, 1st pale .... ,,	0	6½	..	0 6½	0	7	..	0 8
second ..... ,,	0	5½	..	0 6	0	6½	..	0 6½
infer. & dark ,,	0	4½	..	0 5	0	6½	..	0 6½
Bombay (in casks)	0	4½	..	0 0	0	5½	..	0 6
Cod Liver .....per gall.	4	0	..	6 3	4	6	..	5 6
Croton.....per oz.	0	3	..	0 4	1	2	..	1 6
Essential Oils:								
Almond .....per lb.	40	0	..	0 0	40	0	..	0 0
Anise-seed ..... per lb	9	3	to	9 6	11	6	to	0 0
Bay .....per cwt.	76	0	..	80 0	80	0	..	90 0
Bergamot ....per lb.	12	0	..	23 0	11	0	..	16 0
Cajeput, (in bond) per oz.	0	1¾	..	0 2	0	2	..	0 2½

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Essential Oils, *continued*:—				
Caraway .....per lb.	5 3 ..	6 0	5 0 ..	6 6
Cassia ..... ,,	5 6 ..	6 0	6 6 ..	6 8
Cinnamon .....per oz.	1 0 ..	4 3	1 3 ..	3 6
Cinnamon-leaf .. ,,	0 6 ..	0 0	0 5 ..	0 7
Citronelle ..... ,,	0 2½ ..	0 2½	0 2½ ..	0 3
fine..... ,,	0 3½ ..	0 0	0 4 ..	0 0
Clove.....per lb.	2 8 ..	0 0	2 6 ..	0 0
Juniper ..... ,,	1 9 ..	2 0	1 9 ..	2 0
Lavender..... ,,	2 9 ..	3 9	2 9 ..	3 9
Lemon..... ,,	3 6 ..	6 0	5 0 ..	8 0
Lemongrass ....per oz.	0 4½ ..	0 5	0 3 ..	0 7
Neroli ..... ,,	0 0 ..	0 0	3 6 ..	4 6
Nutmeg ..... ,,	0 4 ..	0 7	0 3 ..	0 9
Orange.....per lb.	5 0 ..	7 0	5 0 ..	7 0
Otto of Roses....per oz.	15 0 ..	20 0	16 0 ..	20 9
Peppermint:				
American ....per lb.	19 0 ..	20 0	21 6 ..	21 6
English ..... ,,	38 0 ..	43 0	34 0 ..	44 0
Rosemary ..... ,,	1 9 ..	2 0	1 9 ..	2 0
Sassafras ..... ,,	3 6 ..	4 0	3 0 ..	3 3
Spearmint ..... ,,	14 6 ..	20 0	16 0 ..	25 0
Thyme..... ,,	1 10 ..	4 0	2 0 ..	4 0
Mace, expressed .. per oz.	0 0⅜	0 2½	0 2¼ ..	0 2½
Opium, Turkey ..... ,,	44 0 ..	49 0	19 0 ..	20 0
Egyptian .... ,,	0 0 ..	0 0	3 6 ..	7 0
Quassia(bitter wood) per ton	120 0 ..	130 0	100 0 ..	105 0
Rhubarb, China, good and				
fine .....per lb.	4 6 ..	8 0	6 0 ..	9 0
Good, mid. to ord. ,,	1 0 ..	4 6	1 9 ..	6 0
Dutch trimmed ,,	0 0 ..	0 0	10 0 ..	12 0
Russian ..... ,,	0 0 ..	0 0	9 0 ..	10 0
ROOTS—				
Calumba .....per cwt.	30 0 ..	45 0	20 0 ..	30 0
China ..... ,,	30 0 ..	40 0	30 0 ..	0 0
Galangal ..... ,,	17 0 ..	19 0	16 0 ..	17 0
Gentian ..... ,,	16 0 ..	0 0	16 0 ..	17 0
Hellebore ..... ,,	22 0 ..	30 0	26 0 ..	32 0
Orris..... ,,	38 0 ..	42 0	36 0 ..	42 0
Pellitory ..... ,,	58 0 ..	60 0	58 0 ..	60 0
Pink.....per lb.	0 6 ..	0 9	0 9 ..	0 11
Rhatany ..... ,,	0 6 ..	0 10	0 6 ..	0 10
Senecka..... ,,	1 6 ..	0 0	1 6 ..	0 0
Snake ..... ,,	1 0 ..	0 0	1 0 ..	0 0
Saffron, Spanish ,,	28 0 ..	34 0	30 0 ..	34 0
Salep .....per cwt.	120 0 ..	130 0	100 0 ..	120 0
Sarsaparilla, Lima per lb.	0 7 ..	0 8	0 0 ..	0 0
Para..... ,,	1 0 ..	1 3	0 0 ..	0 0
Honduras ..... ,,	1 0 ..	1 6	0 10 ..	1 4
Jamaica ..... ,,	1 4 ..	2 1	1 0 ..	2 1
Sassafras .....per cwt.	15 0 ..	0 0	10 0 ..	0 0
Scammony, Virgin ..per lb.	28 0 ..	35 0	28 0 ..	36 0
second & ordinary ,,	10 0 ..	23 0	11 0 ..	23 0
Senna. Bombay .... ,,	0 3 ..	0 5½	0 2 ..	0 3½
Tinnivelly ..... ,,	0 2 ..	1 0	0 3 ..	0 10
Alexandria..... ,,	0 7 ..	1 0	0 5 ..	0 10
Spermaceti,refined.. ,,	1 5 ..	0 0	1 6 ..	0 0
American ..... ,,	1 4 ..	0 0	1 6 ..	0 0
Squill..... ,,	0 1 ..	0 2½	0 1 ..	0 2½
Tonquin Beans .. ,,	1 2 ..	1 6	1 0 ..	1 6

GUMS.

Ammoniac, drop ..per cwt.	220	0	..	280	0	180	0 ..	220 0
lump .. ,,	140	0	..	220	0	120	0 ..	160 0
Animi, fine washed ,,	250	0	..	320	0	210	0 ..	230 0
bold scraped ,,	190	0	..	220	0	150	0 ..	210 0
sorts ..... ,,	110	0	..	170	0	100	0 ..	130 0
dark ..... ,,	8	0	..	10	0	70	0 ..	100 0
Arabic, E. I., fine								
pale picked .. ,,	80	0	..	83	0	80	0 ..	82 0
srts, gd. to fin ,,	60	0	..	74	0	65	0 ..	75 0
garblings.. ,,	45	0	..	55	0	68	0 ..	77 0
Turkey, pick. gd to fin. ,,	170	0	..	220	0	170	0 ..	210 0
second & inf. ,,	85	0	..	160	0	85	0 ..	170 0
in sorts .. ,,	70	0	..	100	0	65	0 ..	80 0
Gedda.... ,,	42	0	..	52	0	33	0 ..	40 0
Barbary, white .. ,,	70	0	..	80	0	60	0 ..	70 0
brown... ,,	70	0	..	77	0	68	0 ..	72 0
Australian ..... ,,	34	0	..	41	0	32	0 ..	48 0
Assafœtida,com.to gd ,,	60	0	..	100	0	60	0 ..	100 0
Benjamin, 1st qual. ,,	360	0	..	680	0	180	0 ..	660 0
2nd ,,	140	0	..	230	0	140	0 ..	300 0
3rd ,,	50	0	..	100	0	60	0 ..	120 0
Copal, Angola, red ,,	90	0	..	100	0	60	0 ..	70 0
Benguela .. ,,	85	0	..	95	0	64	6 ..	75 0
Sierra Leone..per lb.	0	6	..	1	1	0	6 ..	1 2
Manilla ....per cwt.	30	0	..	45	0	26	0 ..	45 0
Dammar, pale .... ,,	87	6	..	92	6	65	0 ..	75 0
Euphorbium .... ,,	18	0	..	20	0	18	0 ..	21 0
Galbanum ..... ,,	180	0	..	220	0	240	0 ..	280 0
Gamboge,pckd.pipe ,,	320	0	..	360	1	740	0 ..	980 0
in sorts.. ,,	0	0	..	0	0	0	0 ..	0 0
Guaiacum .....per lb.	0	8	..	1	4	0	6 ..	2 0
Kino .....per cwt.	60	0	..	0	0	60	0 ..	100 0
Kowrie,rough.... ,,	36	0	..	47	0	28	0 ..	46 0
scraped .. ,,	50	0	..	100	0	40	0 ..	75 0
Mastic, picked.....per lb.	5	0	..	6	0	5	6 ..	6 6
Myrrh, gd. & fine per cwt.	200	0	..	280	0	190	0 ..	210 0
sorts..... ,,	100	0	..	190	0	100	0 ..	170 0
Olibanum, p. sorts ,,	75	0	..	82	0	80	0 ..	85 0
amber & ylw. ,,	62	0	..	70	0	77	6 ..	86 0
garblings.... ,,	25	0	..	45	0	30	0 ..	45 0
Senegal .....per cwt.	78	0	..	84	0	80	0 ..	90 0
Sandarac ..... ,,	82	0	..	105	0	85	0 ..	165 0
Thus..... ,,	13	0	to	14	0	12	0 to	0 0
Tragacanth, leaf.. ,,	220	0	..	280	0	240	0 ..	280 0
in sorts ,,	120	0	..	0	0	160	0 ..	220 0

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OILS.				
Seal, pale.....per tun	36 0 ..	0 0	40 0 ..	40 10
yellow to tinged ,,	33 0 ..	35 0	36 0 ..	39 0
brown..... ,,	32 0 ..	0 0	34 0 ..	37 0
Sperm, body ..... ,,	95 0 ..	100 0	110 0 ..	0 0
headmatter ,,	0 0 ..	0 0	0 0 ..	0 0
Cod..... ,,	39 0 ..	40 0	35 0 ..	35 10
Whale, South Sea, pale ,,	36 0 ..	0 0	39 10 ..	0 0
yellow ,,	35 0 ..	0 0	38 0 ..	39 0
brown ,,	33 0 ..	0 0	36 0 ..	37 0
East India, Fish ,,	32 0 ..	0 0	35 0 ..	0 0
Olive, Galipoli ..... ,,	55 0 ..	0 0	72 0 ..	0 0
Trieste ..... ,,	54 0 ..	0 0	71 0 ..	0 0
Levant ..... ,,	49 0 ..	0 0	66 0 ..	0 0
Mogador..... ,,	47 0 ..	0 0	48 0 ..	63 0
Spanish ..... ,,	51 0 ..	52 0	69 0 ..	70 0
Sicily ..... ,,	51 0 ..	0 0	69 0 ..	0 0
Cocoanut, Cochin.. per ton	48 0 ..	0 0	56 0 ..	0 0
Ceylon.. ,,	46 0 ..	0 0	50 0 ..	51 0
Sydney ,,	40 0 ..	45 0	42 0 ..	50 0
Ground Nut and Gingelly:				
Bombay	0 0 ..	0 0	50 0 ..	0 0
Madras.....	35 0 ..	36 0	50 0 ..	55 0
Palm, fine	42 0 ..	0 0	39 10 ..	40 0
Linseed	27 10 ..	0 0	34 10 ..	0 0
Rapeseed, English, pale ..	34 0 ..	0 0	37 0 ..	0 0
brown.....	32 0 ..	0 0	34 10 ..	0 0
Foreign pale....	34 0 ..	0 0	38 10 ..	40 0
brown.....	32 16 ..	0 0	35 0 ..	0 0
Cottonseed	26 0 ..	31 0	32 0 ..	42 0
Lard.....	72 0 ..	0 0	60 0 ..	0 0
Tallow	37 0 ..	38 0	36 0 ..	38 0
Turpentine, American, oks.	33 6 ..	0 0	29 0 ..	29 6
Petroleum, Crude	12 0 ..	0 0	10 0 ..	11 0
	s. d.	s. d.	s. d.	s. d.
refined, per gall.	1 11 ..	2 0	1 3½ ..	1 4
Spirit .. ,,	0 8½ ..	0 9	2 0 ..	2 1
SEEDS.	s. d.	s. d.	s. d.	s. d.
Canary .....per qr.	60 0 ..	65 0	54 0 ..	70 0
Caraway, English per cwt.	0 0 ..	0 0	44 0 ..	46 0
German, &c....	32 0 ..	44 0	40 0 ..	48 0
Coriander	0 0 ..	0 0	18 0 ..	20 0
Hemp .....per qr.	42 0 ..	44 0	42 0 ..	44 0
Linseed, English per qr...	65 0 ..	72 0	0 0 ..	0 0
Black Sea & Azof	57 0 ..	0 0	65 0 ..	0 0
Calcutta ,,	58 0 ..	0 0	68 6 ..	0 0
Bombay ,,	59 0 ..	0 0	68 6 ..	0 0
St. Petrsbrg. ,,	54 0 ..	55 6	63 0 ..	63 6
Mustard, brown..per bshl.	13 0 ..	16 0	0 0 ..	0 0
white.. ,,	12 0 ..	14 0	8 0 ..	10 6
Poppy, East India per qr,	61 0 ..	0 0	56 0 ..	0 0

SPICES.

Cassia Lignea ....per cwt.	130	0	..	140	0	115	0 ..	120 0
Vera ..... ,,	60	0	..	84	0	50	0 ..	70 0
Buds ..... ,,	140	0	..	150	0	170	0 ..	190 0
Cinnamon, Ceylon,								
1st quality ..per lb.	2	4	..	3	2	1	11 ..	2 6
2nd do. ..... ,,	1	4	..	2	10	1	6 ..	2 1
3rd do. ..... ,,	1	8	..	2	6	1	4 ..	2 2
Tellicherry ..... ,,	0	0	..	0	0	2	0 ..	2 1
Cloves, Penang..... ,,	0	10	..	0	11½	0	10 ..	1 0
Amboyna..... ,,	0	5	..	0	6	0	5 ..	0 6
Zanzibar ..... ,,	0	4	..	0	4½	0	3½ ..	0 3½
Ginger, Jam., fine per cwt.	90	0	..	200	0	100	0 ..	150 0
Ord. to good .. ,,	35	0	..	80	0	40	0 ..	95 0
African..... ,,	27	6	..	29	0	29	0 ..	0 0
Bengal ..... ,,	24	0	..	27	0	27	0 ..	27 6
Malabar ..... ,,	0	0	..	0	0	28	0 ..	0 0
Cochin ..... ,,	31	0	..	120	0	44	0 ..	110 0
Pepper, Blk. Malabar, per lb.	0	4½	..	0	5	0	4½ ..	0 5
White, Tellicherry ,,	0	10	..	1	6	0	9 ..	1 9
Cayenne ..... ,,	0	4	..	0	8½	0	6 ..	0 8

VARIOUS PRODUCTS.

COCHINEAL—								
Honduras, black ..per lb.	3	2	..	4	5	3	3 ..	4 4
,, silver .. ,,	2	10	..	3	7	3	2 ..	3 9
,, pasty .. ,,	1	6	..	2	3	1	6 ..	3 0
Mexican, black .... ,,	3	1	..	3	3	3	2 ..	3 5
,, silver .... ,,	2	10	..	0	0	3	0 ..	0 0
Teneriffe, black.... ,,	3	1	..	5	4	3	0 ..	4 1
,, silver.... ,,	2	10	..	3	4	3	0 ..	3 6
GLUE, Town's ....per cwt.	40	0	..	0	0	40	0 ..	60 0
French ..... ,,	62	0	..	0	0	52	0 ..	64 0
GUANO—								
African, &c.....per ton.	60	0	..	0	0	70	0 ..	110 0
Peruvian ..... ,,	£12	10	..	0	0	240	0 ..	0 0
	s.	d.		s.	d.	s.	d.	s. d.
LAC, Shellac, orange p. cwt.	92	6	..	106	0	77	6 ..	91 6
Liver & nat. orange ,,	75	0	..	87	6	57	0 ..	75 0
Garnet..... ,,	75	0	..	81	6	57	6 ..	62 0
Button, dark to mid. ,,	70	0	..	90	6	55	0 ..	79 6
Good and fine .. ,,	92	0	..	112	6	85	0 ..	110 0
Seedlac..... ,,	45	0	..	65	0	55	0 ..	80 0
Sticklac ..... ,,	55	0	..	67	6	45	0 ..	65 0
PUMICE STONE ..per ton	120	0	..	160	0	120	0 ..	160 0
SOAP, Castile ....per cwt.	38	0	..	39	0	38	0 ..	40 0
Marseilles..... ,,	40	0	..	0	0	40	0 ..	0 0
SPONGE, Turk. fin pkd per lb.	0	12	..	1	0	0	12 ..	1 4
..Fair to good ... ,,	0	5	..	0	11	0	5 ..	0 9
Ordinary..... ,,	0	2	..	0	4	0	2 ..	0 3
Bahama..... ,,	0	0	..	0	2	0	8 ..	1 9
TERRA JAPONICA—								
Gambier .. per cwt.	16	3	..	16	9	16	6 ..	17 0
Free cubes ,,	20	0	..	21	0	24	0 ..	26 0
Cutch ..... ,,	28	0	..	30	0	50	0 ..	55 6